products finishing

DECEMBER
1959

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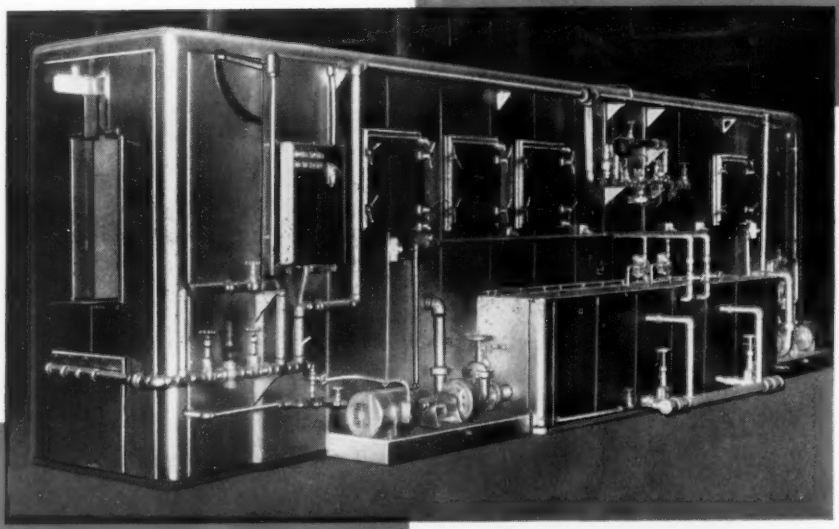
finishes on metal products



shining example of CLEANING EFFICIENCY

Cincinnati **monorail wash, rinse & blow-off machine**

for automotive parts

featuring . . .

- Completely Piped . . . ready for installation
- Insulated . . . for air-conditioned building
- Removable Steam Coils . . . easy maintenance
- Special Access Doors . . . water-tight

Installed in a big, new midwestern automatic transmission plant, this Cincinnati machine cleans an impressive variety and quantity of impeller covers and turbine assemblies.

In addition to a long list of the standard Cincinnati Cleaning features, it is equipped to provide extra savings . . . in installation, production and maintenance.

Cincinnati Cleaning & Finishing Machinery is designed specifically for your production problems, giving substantial savings over the life of the machine. Request a no-cost, no-obligation survey of your cleaning requirements . . . present or future. Write:

Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

For more data circle 301 on Postpaid Card

To get the most out of your barrel finishing

ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 SERVICE MEN • OVER 160 MATERIALS

"Media-matched" Oakite compounds offer extra barrel-finishing economies

Any experienced barrel-operator can tell you that best results come from the right media and compound "mix" . . . where media and work are matched; and the compound matched not only to the work but also to the media.

Some signs of a good match: clean and efficient media; enough lubrication to assure a smooth finish; and faster cutting down, deburring or burnishing.

How to avoid a mismatch? That's where Oakite service can help you. Combine the Oakite man's experience with the tremendous variety of acid, solvent, and abrasive Oakite compounds available, and you're sure to be right.

In the complete line, there are compounds for fast cutting . . . finer finishes . . . tight tolerances . . . for steel, brass, aluminum, zinc, lead and various alloys . . . for hard water or soft. Ask Oakite which is the *right* one to help you get the most from *your* barrel. Bulletin F-9339 tells more. Write Oakite Products, Inc., 20 Rector Street, New York 6, N. Y.

it PAYS to ask Oakite

OAKITE

50 *1909-1959 years' leadership in industrial cleaning* SCIENCE

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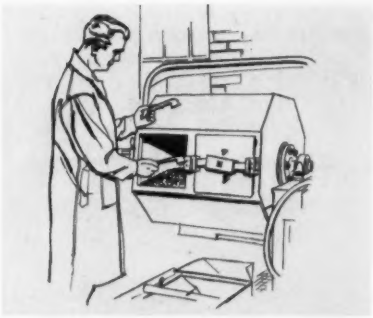


Barrel Finishing is best finishing

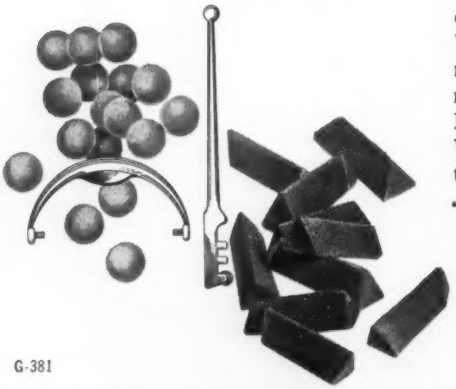
. . . with TUMBLEX bonded abrasives*

Your sure way to cut finishing costs-per-piece is to combine the best barrel finishing techniques with the best abrasives. Norton can help you make the right choices.

Among the wide variety of Norton barrel finishing abrasives, bonded TUMBLEX abrasives are made of ALUNDUM* abrasive in four shapes — "T" triangles, "S" spheres, "TP" triangular pins, "RP" round pins. Available in many sizes, they provide fine, uniform finish, short-time cycles, long, even wear and sure savings on many finishing jobs.

Send samples of parts you finish to our Sample Processing Department. We'll barrel finish, return samples and report the methods and abrasives you need to improve quality and cut costs. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries



NORTON
ABRASIVES

G-381

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals

BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

For more data circle 305 on Postpaid Card

LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY

BUYING 99+% NICKEL?

Here's why you should

CHECK WHAT'S IN THE...1%

Of course, you, as a nickel user, want 99% pure nickel anodes . . . but, it's that 1% that makes the difference between good and bad plate.

At Allied Research, we make sure that 1% gives you a better performing, more economical anode, for fast, smooth, low-cost and efficient plating.

Here's how:

1. All our nickel anodes are cast from 100% electrolytic nickel—free from harmful contaminates.
2. Carbon and silicon are carefully added to assure you of even, constant corrosion rate and faster, smoother plating.
3. Copper and iron are kept to a minimum—well below the most rigid specifications—eliminating excessive brightener consumption, down time or rejects.

NEW ALLIED RESEARCH ANODE PAK

Sturdy, corrugated cartons keep your anodes clean, uncontaminated—ready to use. Paks make handling, storage and inventory easier, too.

NICKEL RECASTING SERVICE

Your nickel butts and spears recast under the same rigid controls. For really substantial savings, get details on our Nickel Recast Blanket Purchase Plan.

For full information on Allied Research Nickel Anodes, Anode Pak or our Nickel Recasting Service, contact your Allied Field Engineer. He's listed in the yellow pages under "Plating Supplies". Or, write for FREE TECHNICAL DATA FILES.

Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET • BALTIMORE 5, MARYLAND
BRANCH PLANT: 400 MIDLAND AVENUE • DETROIT 3, MICHIGAN
West Coast Licensee for Process Chemicals: L. H. Butcher Co.

Chemical and Electrochemical Processes, Anodes, Rectifiers Equipment, and Supplies for Metal Finishing

IRIDITE®	IRILAC®	ISOBRITE®	ARP®	WAGNER
Chromate Coatings	Clear Coatings	Plating Brighteners	Chemicals & Supplies	Line of Equipment

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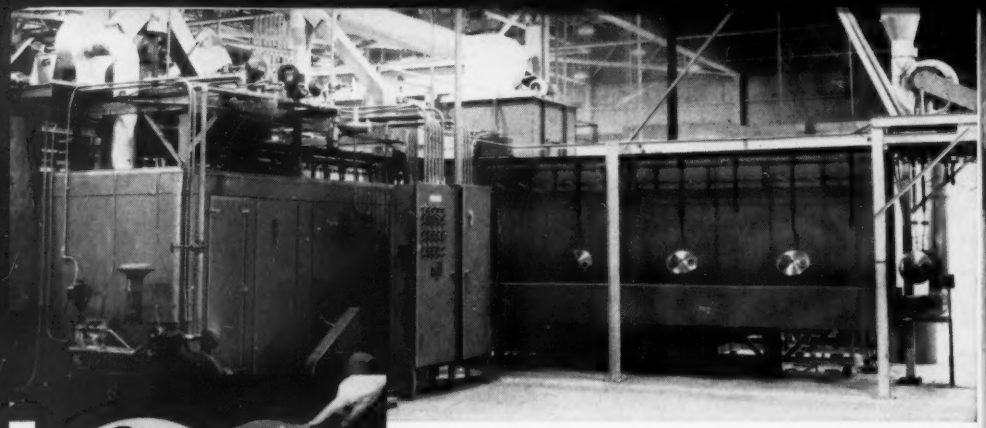

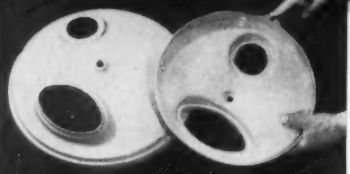

JOB REPORT

PRODUCT:

Stamped steel covers and structural components for high-voltage Westinghouse transformers. Coated with CORVEL cellulosic to provide 12000 volts insulation, a gasketless seal, and a durable, decorative weather proof surface.

PROCESS:

Preheat parts, dip in "fluidized" bed of fine, dry plastic powder, and postheat. Oven temperatures held to plus or minus 5°F. Licensed fluidized bed process deposits tough, corrosion-resistant coating of uniform thickness on all surfaces, regardless of part configuration.

PRODUCTION:

Uninterrupted production of finish-coated parts from conveyorized installation of preheating ovens, dipping tanks, excess powder blow-off and collection units, and postheating ovens—custom engineered, fabricated and erected by MOCO for economical operation by Westinghouse Electric Corporation.

*Trademark of The Polymer Corporation for finishing materials.

MOCO, the Polymer Corporation and Westinghouse Team-up to Beat the Elements!

Teaming up to take advantage of the unique new fluidized bed coating process, Michigan Oven Company, The Polymer Corporation and Westinghouse Electric Corporation engineers recently completed target-date installation of a system for applying CORVEL* fusion bond coatings at a modern new Westinghouse manufacturing center.

Designed to apply a protective coating on transformer covers, the new system demanded accurate timing and temperature control of parts during pre-heating and post-heating, complete scavenging of excess powder (for general safety reasons as well as economic ones), and continuous movement of parts in a specified path for uniform dip-coating.

Experienced MOCO design and process engineers provided an integrated system of ducts, blowers, conveyors, and heating and control equipment completely meeting Westinghouse specifications for quantity, quality and cost.

MOCO problem-solvers will welcome the opportunity to team their talents with yours. Write for the name of our representative nearest you.

FREE—Send for your MOCO bulletin showing typical finishing system applications and specifications; no cost or obligation, of course.

MICHIGAN OVEN COMPANY

MOCO

FINISHING EQUIPMENT DEPT.
423 BRAINARD
DETROIT 1, MICHIGAN

Washing Machines • Bonderizing Units • Dry-off Ovens
Dip Tanks • Spray Booths • Flo-coaters • Finishing Ovens • Conveyors

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products finishing

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Member
BPA
Metal Finishing Suppliers Association, Inc.

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Published monthly with two issues in March and copyrighted (1959) by Gardner Publications, Inc., 431 Main St., Cincinnati, Ohio. Printed in U.S.A.

For more data on advertisement on opposite page, circle 307 on Postpaid Card

Daconite 5600 saves time and money on production, makes your product sell faster! It is a ready-to-spray lacquer, (Alkyd fortified) recommended for use over blond stains, light fillers, light natural woods, Masonite, metal.

5600 has excellent cold check resistance. It produces a finish of exceptional paleness and color retention quality. Will not ring from alcohol, water or hot dishes. Highly resistant to scuffing, scratching.

5600 has been fully tested. It has the time and money saving features you demand for production line economy and superior finished results.

Write on your letterhead for specifications sheet and testing samples.

JAMES B. DAY & COMPANY
1872 CLYBOURN AVE., CHICAGO 14, ILL.
fine production finishes for industry since 1906
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products finishing

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★ ★ ★

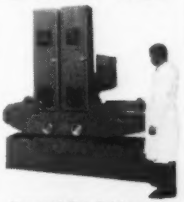
Circulation over 22,500— largest in the finishing field

GRIND...POLISH...DEBURR in one operation with Hammond FLAT FINISHERS

For fast, uniform, economical finishing of flat work such as sheets, bars, strips, stampings and extrusions with one machine, one operator and one pass.

AUTOMATIC AIR TENSIONING: maintains correct tension on abrasive belts and conveyor belt • **VARIABLE SPEED CONVEYOR:** rate of feed is adjustable from 0 to 60 FPM • **WORK HOLDERS:** hold-down rolls, electro-magnetic platen and various types of conveyor belts • **AMMETER CONTROL:** an ammeter for each head allows operator to determine and maintain the polishing pressure necessary for a uniform finish and longer belt life • **V-BELT DRIVE:** allows abrasive belt speed to be changed to suit the work • **MICROMETER DIAL:** controls heads for required depth of cut.

1 TO 6 HEADS
6" to 12" WIDE



Hammond Flat Finishers are available in 6", 8", 10" and 12" widths — handle work up to 6" high.

Write for literature today.

SEND SAMPLES
Send us one finished and several rough samples. You will receive a complete Engineering Report and Production Analysis without obligation.

Hammond Machinery Builders INC.

1622 DOUGLAS AVE. • KALAMAZOO, MICHIGAN

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COPPER SULFATE
NICKEL SULFATE

FROM

PHELPS DODGE

give you standard purity, uniformity, solubility... **plus:**

YOU ARE DEALING WITH A NAME YOU KNOW

Phelps Dodge, with over 60 years experience in supplying the plating field, is a dependable source of supply.

YOUR ORDERS ARE PACKED TO SUIT INVENTORYING DEMANDS

...shipped to you in 100-lb. sacks, and fibreboard drums, **the way it is easiest for you to handle.**

PHELPS DODGE IS ALSO A PRODUCER OF SELENIUM AND TELLURIUM

THERE'S NEVER A WAIT FOR SHIPMENT

Orders are filled promptly from ready-to-ship stocks.

PHELPS DODGE REFINING CORP.

300 PARK AVENUE, NEW YORK 22, NEW YORK

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There is a DETREX process for all cleaning needs—Zinc, Steel, Brass, Copper, Nickel, etc.

"Progress" is another word for DETREX. By continuing research in the laboratory and in the field, plus a constant awareness of new methods and techniques, DETREX has developed cleaning processes for the Electroplating industry that have been needed for years.

These new processes assure absolute removal of buffing and polishing compounds, and all other intentional soils. Your present equipment is adequate for these new processes.

Whatever your cleaning requirement, and regardless of your location, a DETREX Engineer will be glad to give you complete technical information on these important new developments. To keep pace with progress—write today to:

DETREX CHEMICAL INDUSTRIES, INC.

Box 501, Dept. PF-1259, Detroit 32, Michigan

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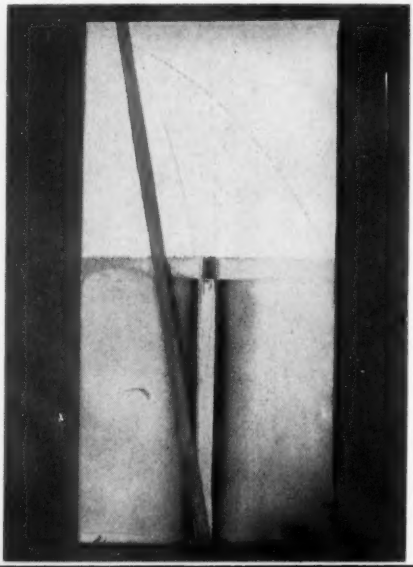
QUALITY FINISHES

FOR THE PLATING INDUSTRY



QUALITY THAT SPEAKS FOR ITSELF—The upper half of the above silver plate was finished with Nikolas 2105 Clear Lacquer; the lower half with competitive recommended clear silver lacquer. A rubber band was placed over the two finishes and in two weeks the free sulphur had penetrated the competitive material with the above results.

The same results can be expected when testing No. 2105 Clear Lacquer for Hardness, Mar-resistance and Discoloration from direct sunlight.

The finest plated goods are protected by Nikolas Clear Finishes.

Eye Appeal Sells Your Product!

Sixty-Seven Years of manufacturing know how available for any of your finishing problems.

NIKOLAS

G. J. Nikolas & Co., Inc.

2880 Washington Blvd., Bellwood, Ill.
33 Grand St., Brooklyn, N. Y.

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Yes, there's an answer to corrosion, after all

the udylite

Bi/NICKEL® PROCESS

The combination nickel that's making plating history

only from Bi/NICKEL *do you get all these benefits*

1 **SUPERB CORROSION RESISTANCE**

Under actual exposure to highly corrosive atmospheres as well as accelerated CASS and Corrodkote tests Bi/NICKEL has proven its superiority over other bright nickel coatings.

2 **THE MOST BEAUTIFUL FINISH**

Color and brilliance obtained with Bi/NICKEL incorporating Udylite Bright Nickel, such as the Incomparable 66 and other Udylite nickel processes, cannot be matched.

3 **ADHESION PROBLEMS LICKED**

Bi/NICKEL offers a solution to adhesion problems previously considered inherent in combination nickel processes. Chrome finishes "take" to Bi/NICKEL with remarkable facility.

4 **FULL RANGE OF COMBINATIONS**

There is a version of Udylite's Bi/NICKEL which is adaptable to your product and problem whatever the demands of basis metal or the limitations of your already installed equipment.

5 **INCREASED PRODUCT POTENTIAL**

Here in Bi/NICKEL is a process that will immeasurably enhance the real value of the products to which it's applied. Longer life of usefulness and beauty can be expected from a Bi/NICKEL-Chromium finish. It gives you a real talking point when it comes to sales.

6 **ANSWERS CUSTOMER COMPLAINTS**

Bi/NICKEL is a step in the right direction toward solution of corrosion problems that have harassed automotive manufacturers and all others where corrosion has been a factor in a product's "life expectancy".

Discover TODAY how the Udylite Bi/NICKEL process is just what you've been looking for to meet and beat your corrosion problem.

you get Bi/NICKEL *only from*

the udylite corporation

DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

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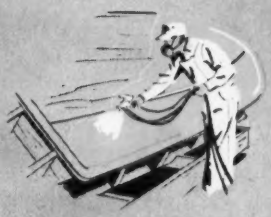
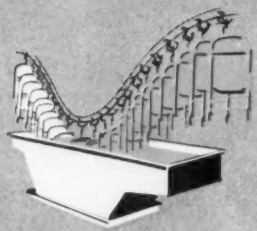
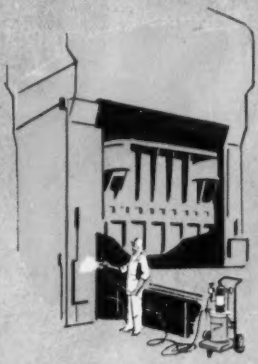
Automatic car painting



Fiberglass boat fabrication



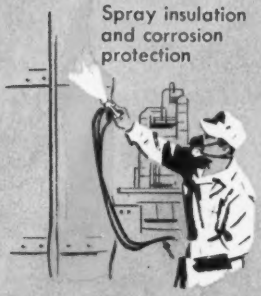
High production coating
of metal furniture



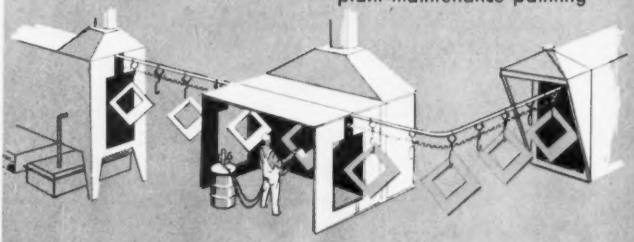
In-plant painting
of bulky machinery

Quality finishing
with built-in sales appeal

Spray insulation
and corrosion
protection



Fast, efficient
plant maintenance painting



Complete systems for surface preparation, finishing, drying

FOR BETTER SERVICE, BUY

DEVILBISS

THE DEVILBISS COMPANY

Toledo 1, Ohio

Barrie, Ontario • London, England
São Paulo, Brazil
Branch Offices in Principal Cities

MANAGEMENT OBJECTIVE:

Determine best method and equipment for surface preparation and coating

ACTION: **Contact DeVilbiss**

HERE'S WHY: With the industry's most complete line of surface-preparation and coating and finishing equipment to draw on, DeVilbiss can supply you with matched components that complement one another to form a smooth-functioning system tailored to your requirements. DeVilbiss is the one "single source" fully qualified to analyze your needs, then let you select the best, most economical product combination to fit your job. Engineering and service facilities are available coast to coast. Just contact our nearest branch office, or write us direct.

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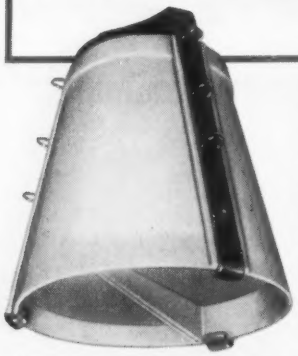
NOW!–Stevens ALL NEW Barrel of "MIRACLE" MATERIAL STEVALITE

LIGHTER
STRONGER
LONGER LASTING



Here's Why Stevens Can Offer You a Barrel superior to anything else on the market today:

THE MATERIAL

Stevalite . . . tremendous impact strength . . . heat resistance to 270° i 50% lighter than any other material.

THE DESIGN

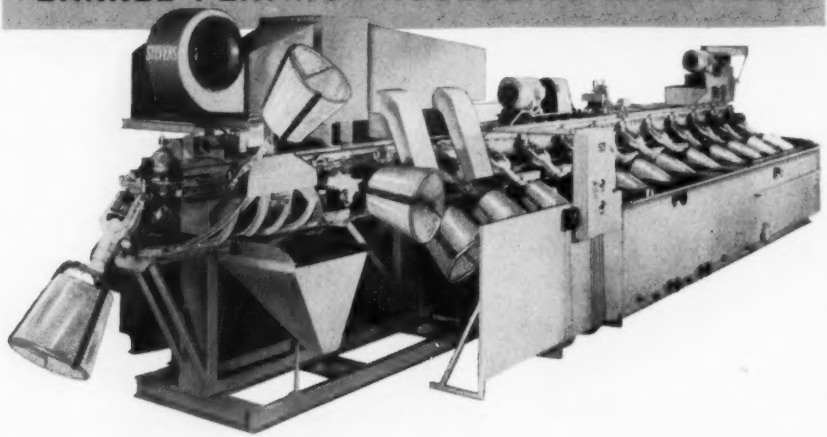
Oblique barrel tumbles parts more effectively giving improved plate distribution. Thinner wall decreases solution dragout. Dense perforation count boosts current draw and plating speed up to 30%. Faster drying.

THE CONSTRUCTION

Rigid, rugged *all welded* . . . unaffected by heat distortion . . . reinforced to resist damage. Minimum number of necessary parts.

You cannot buy a more efficient and productive barrel anywhere. Simple in conception and construction, it can guarantee you real maintenance-free performance and long productive life . . . the perfect barrel.

FOR USE ON ALL STEVENS AUTOMATIC BARREL PLATING-PROCESSING MACHINES



frederic b. **STEVENS,** inc.

DETROIT 16, MICH.

BUFFALO CHICAGO DETROIT CLEVELAND
DAYTON NEW HAVEN INDIANAPOLIS SPRINGFIELD (OHIO)

Remember — When you go *automatic* . . . go STEVENS!
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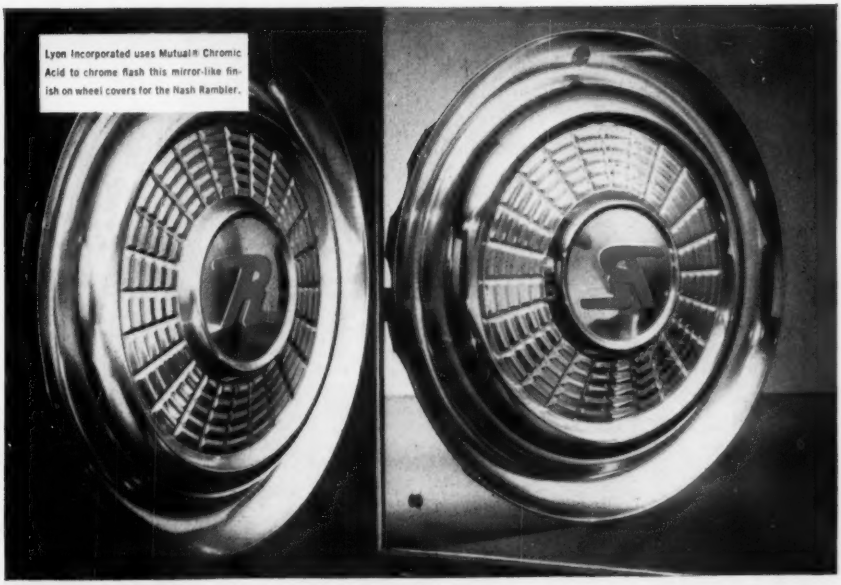

Lyon Incorporated uses Mutual® Chromic Acid to chrome flash this mirror-like finish on wheel covers for the Nash Rambler.

MIRROR FINISH OVER STAINLESS!

Chrome flashed by skilled plater using MUTUAL CHROMIC ACID

Experienced platers, like Lyon Incorporated, rely on high purity Mutual Chromic Acid to produce chrome plate that's decorative and durable. Combining careful control and plating skill with Mutual Chromic Acid, Lyon produces a mirror-like finish on wheel covers for the Nash Rambler. The plating is done over 301 Stainless Steel in a bath of slightly lower acid-sulfate ratio than that used for chrome plating over nickel.

Mutual Chromic Acid is always 99.75% pure—or better. Its low sulfate content (less than 0.1%) makes it easy for you to control the acid-sulfate ratio of your plating bath. This safeguards against plating difficulties—and expensive rejects!

For technical information about Mutual Chromic Acid, send coupon for our free booklet, "Chromium Chemicals." Our Technical Service Staff will also be happy to answer your questions.

OTHER PRODUCTS FOR PLATERS

SOLVAY® Ammonium Bicarbonate • SOLVAY Caustic Soda
SOLVAY Hydrogen Peroxide • SOLVAY Methylene Chloride

Allied Chemical

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N. Y.

MUTUAL chromium chemicals are available through dealers and SOLVAY branch offices located in major centers from coast to coast.

SOLVAY PROCESS DIVISION 26-129
Allied Chemical Corporation
61 Broadway, New York 6, N. Y.

☐ Send Bulletin 52 "Chromium Chemicals"
☐ Have a representative phone for appointment

NAME _____
POSITION _____
COMPANY _____
PHONE _____
ADDRESS _____
CITY _____ ZONE ____ STATE _____

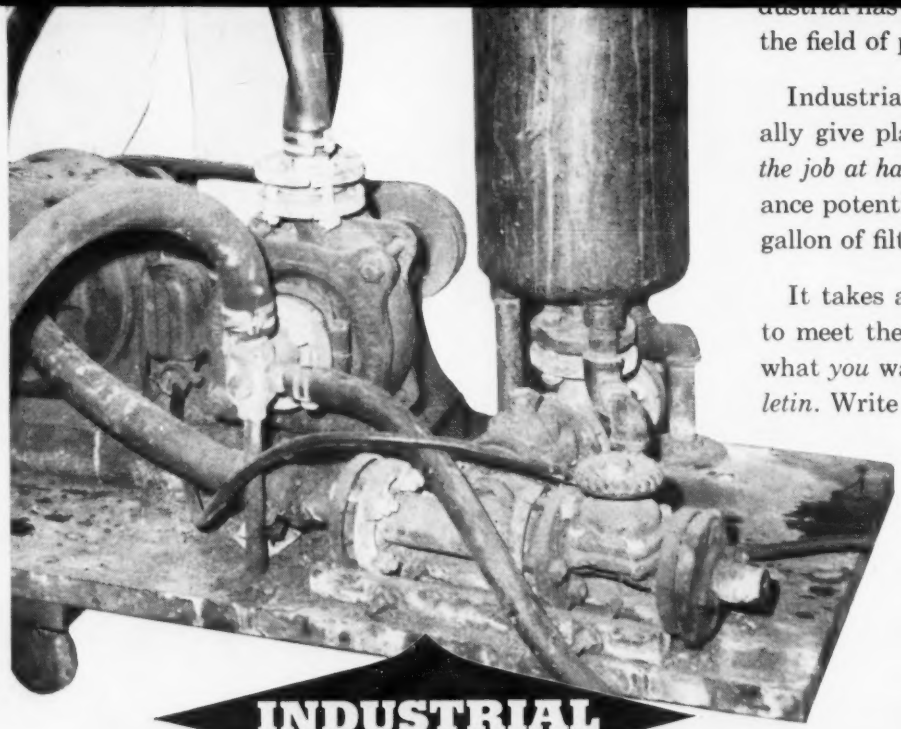
For more data circle 316 on Postpaid Card

Charlie Ott got what he wanted in a plating filter . . .

In 1929, C. F. Ott, now owner and president of Aircraft Plating and Polishing Company, grew impatient with breakdowns. He wanted a dependable, rugged plating filter. He got what he wanted—*in this early Type 111 Industrial filter.*

"Betsy's been in harness daily for over 30 years"

■ Thirty years ago, "Betsy" was one of only 9 sizes of the Type 111 filter. Today, this "Workhorse of the Industry" is available in *25 standard sizes.* Flow capacities range from 100 to over 30,000 gph. This growth in Type 111 *versatility* is typical of why and how In-



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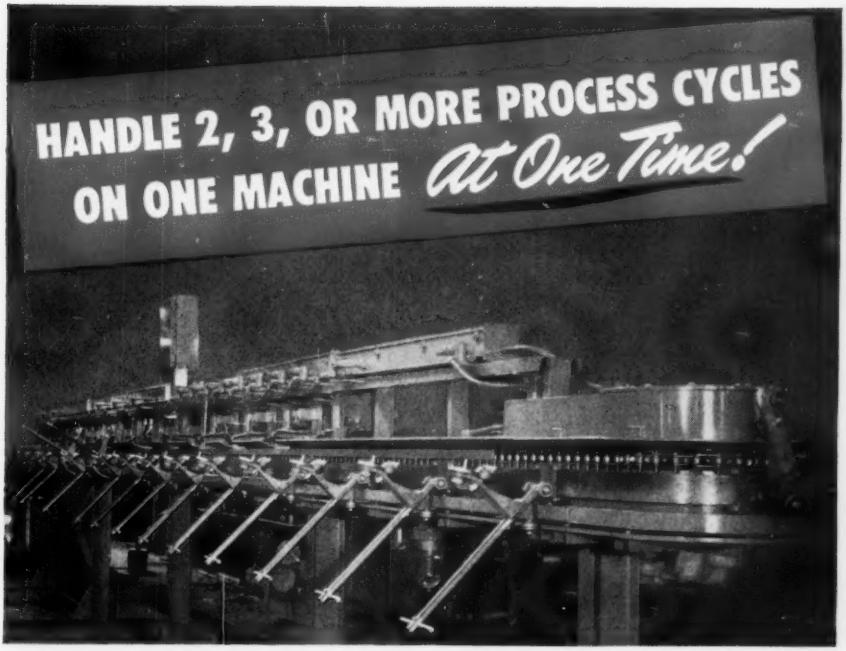

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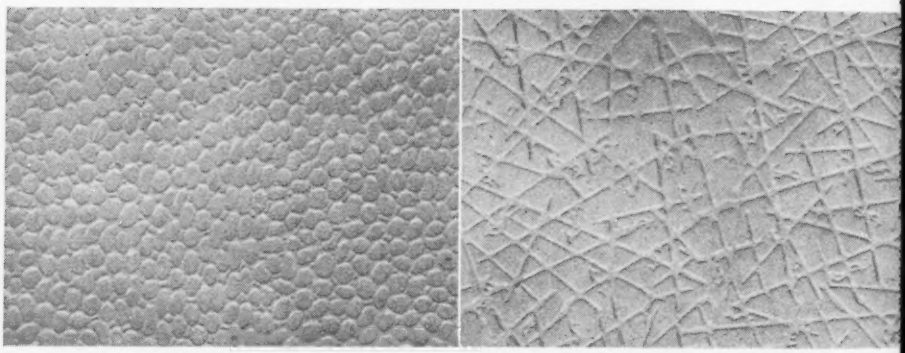


Unichrome Finish 6440 is a handsome colorful vinyl finish that faithfully mirrors the underlying surface whether patterned or smooth. Chemically resistant, it protects against staining and corrosion.

New M&T sprayed vinyl finishes make products look better–wear ten times longer than baked enamel

Now you can add extra appeal to your products at little extra cost, thanks to two vinyl finishes recently developed by Metal & Thermit. Both are available in any color you specify.

Unichrome Finish 6400 is for spraying on smooth metal products. It produces a fine finish with the luxurious look of leather.

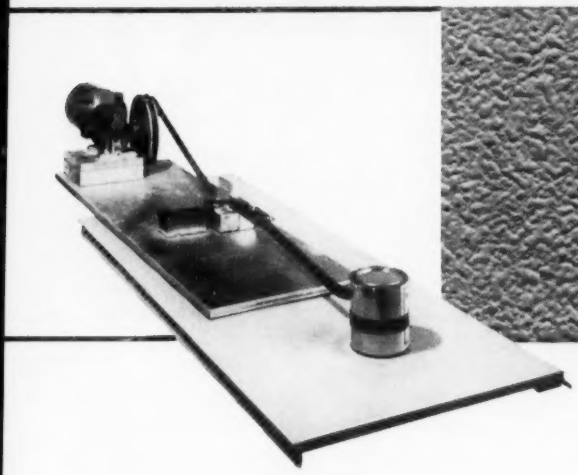
Unichrome Finish 6440 faithfully mirrors the mill-patterned steel or aluminum it coats. It can be sprayed thick or thin, adds color to the metal—and a feeling of warmth, too.

Both of these sprayed vinyl coatings offer you many other advantages. Durability is chief among these. Tests have proved that both coatings are up to ten times more wear resistant than the usual baked textured enamel. Their inherent chemical resistance means protection against stains and corrosion. And they aid in deadening sound, too.

On the production line, you can eliminate expensive scrap loss incurred with laminates by *spraying* the finish onto the product. In addition, these sprayed vinyl finishes eliminate seam problems at all joints, and raw metal at edges.

The M&T man has complete information on these Unichrome Coatings. Or send for details.

DURABILITY



Unichrome Finish 6400 is a mar-resistant rich vinyl finish with the appealing texture of leather. It makes smooth metal a thing of beauty – protects it from corrosion and stains.

Durability test: 535,000 rubs

Recently a midwestern company was asked to design the interior of a new supermarket. They had become increasingly disappointed with the performance of the baked enamel steel shelving they had been using in many other stores.

So they gave a baked enamel shelf the "can test"–a #10 can of tomatoes sliding continuously over the shelf. After 20,000 to 30,000 such rubs from the seven-pound can, the enamel began to show marked wear.

The can test was also given to a steel shelf coated with Unichrome Finish 6400. Results were amazing. After 535,000 rubs the bottom had worn off the can of tomatoes. But the textured finish was just like new.

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AK ETCHES, with *ease* and *efficiency!* This unique formulation works on all aluminum alloys and *prevents formation* of aluminum oxide scale by means of a special sequestering agent. No more scale means no more down-time for costly clean-up . . . less chance for coil and tank damage in maintenance . . . better temperature control . . . longer solution life, with lower product consumption . . . greater operational safety through the elimination of mid-shift dumping. Cowles AK gives a more uniform finish for plus results through easier inspection, quality improvement and increased end product sales appeal.

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DO DE-SMUTS, *without hazard* to safety! Personnel problems connected with the handling dangers of liquid acids disappear overnight with *powdered acid* Cowles DO. Highly efficient, DO solutions de-oxidize the primary aluminum oxide film rapidly, then re-oxidize the metal surface slowly and uniformly with an air-stable oxide film and no residue of smut. Surfaces are super-clean for spot-welding, anodizing or chromate finishing. Recommended cleaning concentrations and solution temperatures are low—total solid content remains low . . . rapid drying-on is inhibited . . . residual film is minimized . . . rinsing is facilitated.

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Season's
Greetings
Products
Finishing

Finishing Zippo Lighters

Mechanized finishing processes, rigid process and quality controls . . .

By EZRA A. BLOUNT
Editor

Zippo Manufacturing Company developed into a successful business enterprise by designing a lighter that lives up to a simple slogan: "It Works." The Bradford, Pa., firm has grown by producing a simple, foolproof mechanism that will perform satisfactorily for many years.

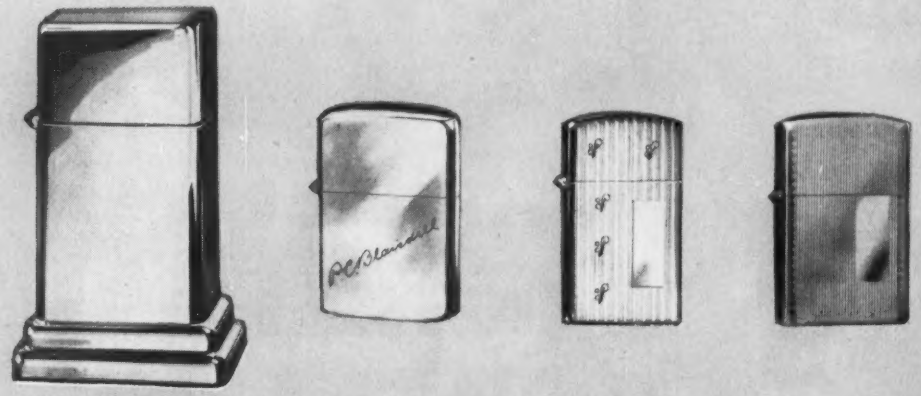
Zippo's durable mechanism must be enclosed in an attractive case to give the product fullest "sales appeal." Since the fiinishing department is responsible only for the appearance of the product, it can adopt for a slogan to describe the lighter, "It's Beautiful." No effort is spared to fulfill that slogan in the efficient finishing department at Zippo.

Mechanized processes are employed wherever possible. Rigid quality controls and high inspection standards make sure that only high-quality finishes are produced.

Fabricating and Finishing "Inside Units"

The principal metal parts of Zippo lighters to be finished are the "inside unit" and the case. Inside units are formed from coils of 0.018-inch stainless steel strip stock which feed automatically through punching and forming presses. The formed unit is welded. A stainless steel plate is then pressed into the formed inside unit and soldered into place with the aid of induction heating in an automatic conveyorized machine.

Stainless steel inside unit chim-



neys are buffed to a brilliant finish automatically on a Harper automatic buffing machine (Figs. 1, 2). The units, mounted on fixtures, pass between pairs of 20-inch-face cloth bias buffing wheels. Wheels in each pair are rotating in opposite directions. This holds the units on the fixtures. Each fixture indexes automatically. Lea liquid buffing compound is sprayed on.

The units are also satin finished in the same operation on this machine. Inside units, on fixtures, are polished on one side at a time. They index six times as they pass through the process. Loading and unloading are done at the same point.

Satin finished inside units are degreased in a vapor degreaser using Hooker Nialk Trichlorethylene (Fig. 3) before being sent to final assembly. For most lighters this completes the finish on the inside unit; however, units for gold lighters are gold plated.

Case Manufacture, Polishing, Buffing

Cases for Zippo lighters are formed from 0.025-0.027 brass strip stock. Coiled stock feeds automatically into blanking and forming presses (Fig. 4). After blanking, each case bottom is drawn to complete the forming operation. Case parts are annealed prior to the final drawing operation. The Zippo trademark is then embossed in each lighter base, and case

George G. Blaisdell, founder and president of Zippo Manufacturing Company. Mr. Blaisdell is described as an unreconstructed American craftsman—who believes that a cigarette lighter should last a lifetime. It works every time—or he repairs it free.

Zippo Lighters. (Left to right): Barcroft desk or table lighter, finished in satin finish chrome; de luxe Zippo, highly polished bright chrome, engraved signature; gold-filled Zippo, 10-karat gold fused to case; engine-turned Zippo, polished bright chrome finish.

Zippo lighters in brush chrome or polished bright chrome can be engraved and filled with designs in as many colors as desired.

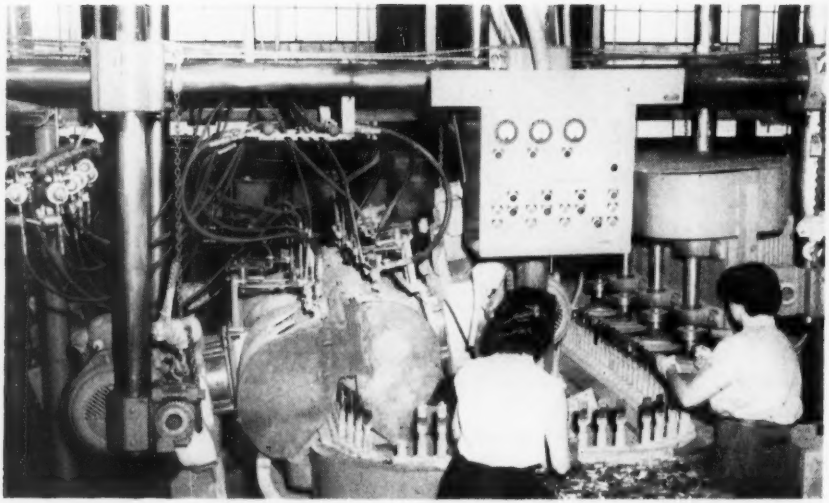


Fig. 1—Operator at left loads stainless steel Zippo inside units on a Harper automatic buffing machine. Operator at right unloads the finished units from the conveyor.

parts are then trimmed and notched. Lighter case tops are attached to bottoms with nickel-silver hinges which are spot welded into position. Hinges are also manufactured by Zippo.

Most brass lighter cases receive a bright buffed finish on edges and a satin finish on the sides. Tripoli buffing of edges is done automatically on a conveyorized buffing machine (Fig. 5). Sides are buffed on a similar ma-

The Zippo Lighter and How It Grew . . .

A lighter that works is a good product, and a good product must sell. With this conviction as his watchword, George G. Blaisdell in 1933 designed the first Zippo lighter. The basic design hasn't changed very much over the years but the exterior finishes available have been expanded so that lighters of many colors and surface designs are available. Bulk of the production is in the popular brushed chrome finish, which retains its pleasing appearance for years.

The Zippo Lighter was born in a tiny corner of the second floor of a tire service station in Bradford, Pennsylvania. Three employees were associated with Mr. Blaisdell in producing the first lighters. First month's production was 82 lighters, sales of which brought in $69.15.

Sales of the new lighters were not great in the recession years of 1933 to 1935, but through a number of clever promotions, some

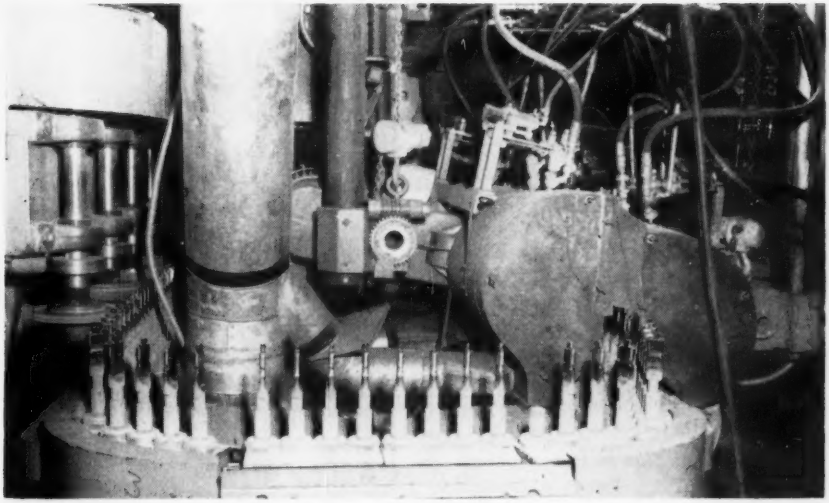


Fig. 2—Opposite end of the Harper automatic. Units are rotated on the spindles as necessary to produce an even, brilliant finish. Liquid buffing compound is sprayed on.

chine (Fig. 6). Bright color buffing on edges is done by semi-automatic equipment. Tops and bottoms are buffed on one machine (Fig. 7); sides are buffed on another. Lighter cases are placed in holders for buffing tops, turned so that bottoms may be buffed. Sides are buffed in similar fixtures—one edge buffed, case turned, opposite edge buffed. Hammond automatic bar feeders are used on some machines, while on

lighters were sold and the product began to gain recognition. In 1936 the first order for a large number of engraved lighters, to be presented as contest prizes, was received. The presentation idea was good publicity and good public relations, and, as many companies began to use the idea and buy lighters, the Zippo gradually grew, expanded, and prospered. Today the company sells more lighters than any other lighter manufacturer. Two thousand wholesalers today move Zippos through 100,000 retail outlets, in addition to the 20,000 commercial accounts that Zippo services.

Another factor that has aided in Zippo's top position in the industry is the bona fide offer of the company to repair any Zippo that doesn't work absolutely free. The more Zippos that are repaired free in the Zippo Repair Clinic, the happier is the boss. "Think how many people are saying nice things about Zippo," is his reaction.

others the operators apply tripoli to buffs by hand.

After case edges are color buffed, the sides are satin finished in a Curtis automatic polishing machine, which is connected to a degreaser. In this conveyorized machine, cases, mounted in holders, are satin finished with Carborundum abrasive belts. Parts are polished on one side, turned over automatically and polished on the other side. A Circo spray-vapor degreaser removes oil and dirt before parts travel to the plating room.

The visitor to the Zippo Manufacturing Company is immediately impressed not only with the efficiency and mechanization, but also with the cleanliness of the plant. Plant cleanliness is emphasized in the buffing and polishing depart-

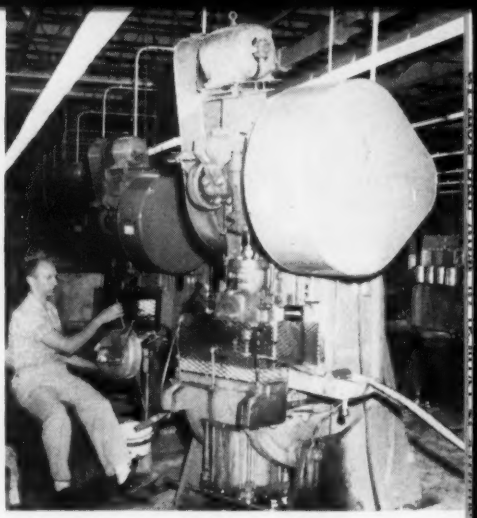


Fig. 4—Brass strip feeds into blanking press, the first step in making lighter cases.

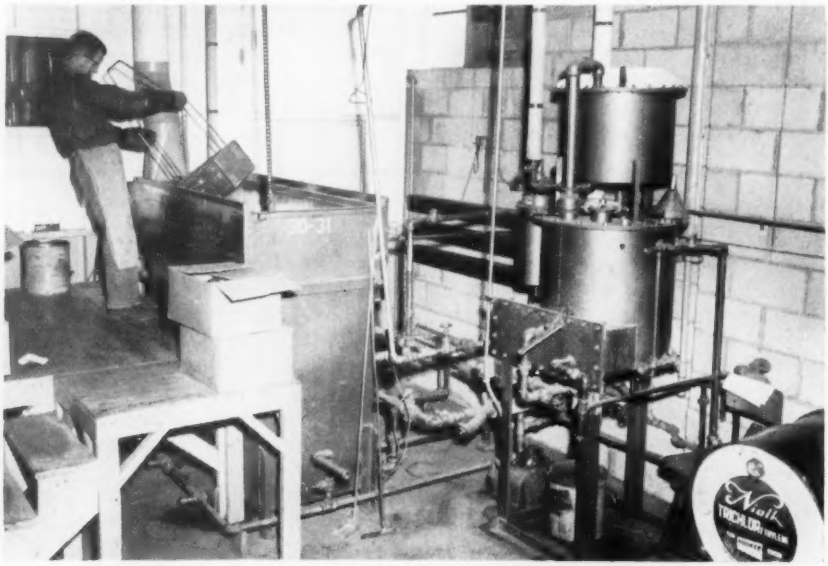


Fig. 3—Buffed stainless steel inside units are cleaned in Blakeslee vapor degreaser before going to assembly. Degreaser removes tripoli buffing compound prior to color buffing.

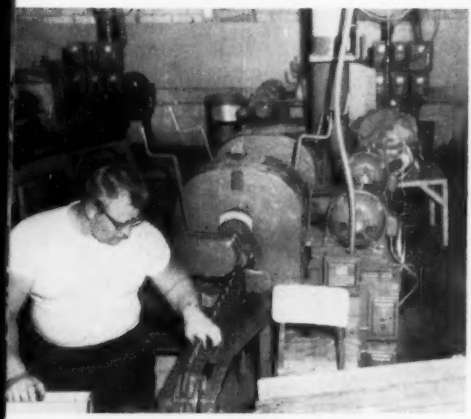


Fig. 5—Automatic buffing machine tripoli buffs the edges of brass lighter cases.

ment, too, where one would normally expect to find some dust and dirt. Exhaust hoods on all the buffing machines in the Zippo buffing department remove dust and dirt through ducts which empty into an American Air Filter wet-type Roto-Clone. Here the dust is precipitated from the air and removed as sludge.

Nickel and Chromium Plating

Zippo lighter cases are racked for plating in the open position so that all processing solutions will drain easily as cases are taken from tank to tank. They are arranged on the rack to prevent "shielding" and assure adequate coverage of all surfaces. Zippo designs and builds its own plating racks, protecting them with plastisol rack coating.

Cases are nickel and chromium plated on an automatic plating machine (Fig. 8). This machine has 36 stations and will process 110 racks of cases per hour. Solution tanks vary in length according to

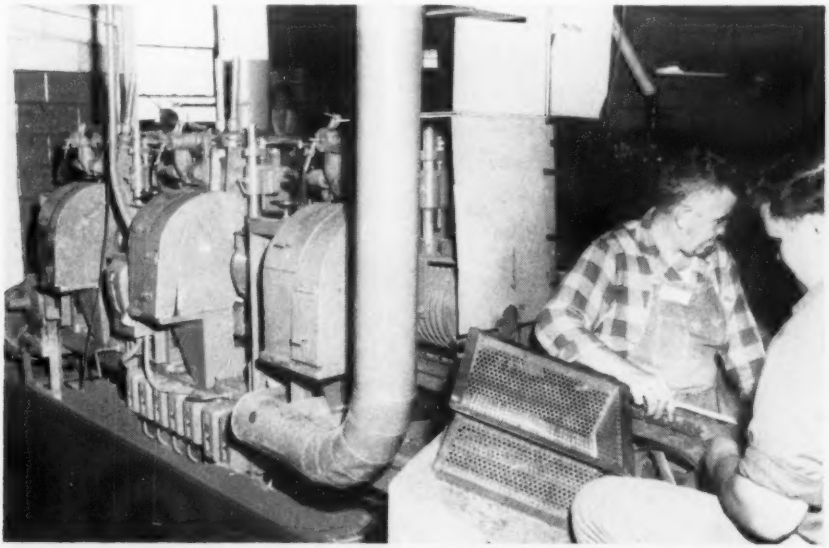


Fig. 6—Sides of Zippo lighter cases are tripoli-buffed on an automatic buffing machine. Endless belt conveyor carries cases under buffing wheels, returns to loading station.

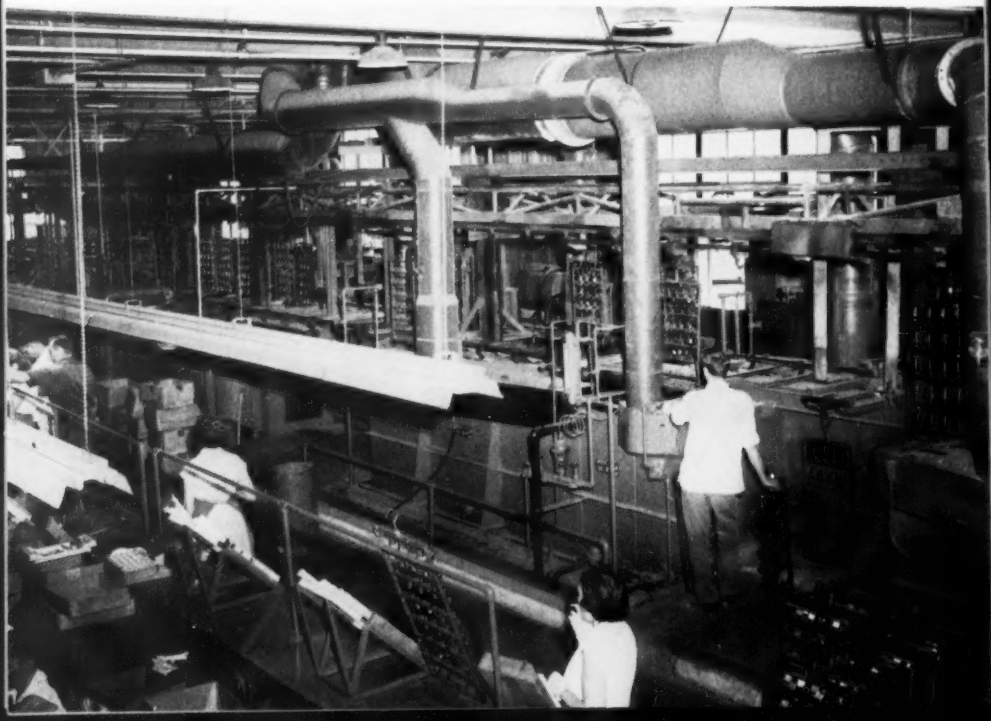
"A fine mist water spray wets parts as they leave the nickel plating tank."

Fig. 7—Specially designed semi-automatic buffing machines bright buff the edges, tops and bottoms of the brass lighter cases.

the time cycle specified for each solution. The plating cycle for depositing nickel and chromium:

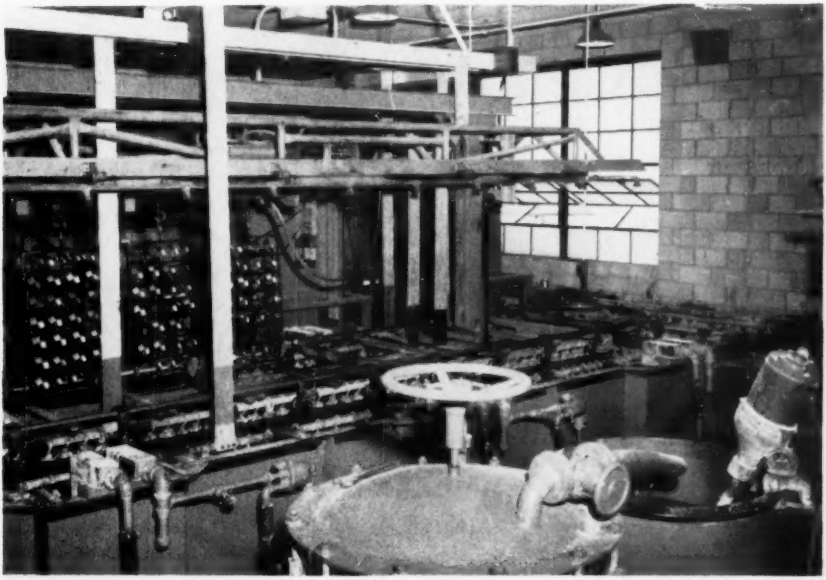
1. Load racks on automatic plating machine.
2. Soak clean in MacDermid Metalex Special W.
3. Cathodic clean in Metex BG. Fine water mist sprays wet parts as they leave each cleaner tank. Water spray into each tank makes up evaporation losses.
4. Cold water dip and spray rinse.
5. Cold water dip and spray rinse.
6. Dip in cold 10 per cent sulfuric acid.
7. Cold water dip and spray rinse.
8. Cold water dip and spray rinse.

Fig. 8—Plating room at Zippo Manufacturing Co., showing the racking area and Udylite automatic plating machine. Entire plant is kept well painted, clean and orderly.



9. Anodic clean in Metex B. G. Fine mist spray wets parts as they leave tank.
10. Cold water spray rinse.
11. Cold water dip and spray rinse.
12. Dip in cold sulfuric acid.
13. Cold water spray rinse.
14. Cold water spray rinse.
15. Soak clean.
16. Cold water spray rinse.
17. Cold water spray rinse.
18. Dip in cold 10 per cent sulfuric acid.
19. Cold water spray rinse.
20. Bright nickel plate. Bright buffed surfaces remain bright, satin finished surfaces retain satin finish. A fine mist water spray wets parts as they leave the nickel plating tank.
21. Dragout dip rinse. This is pumped into the nickel tank as required to replace water evaporation losses.
22. Water spray rinse.
23. Water spray rinse.
24. Chromium plate.
25. Dragout rinse. This solution is pumped into the chromium plating tank to replace evaporation losses.
26. Cold water dip rinse.
27. Cold water dip rinse.
28. Cold water dip rinse. Air agitation.
29. Cold water spray and dip rinse.
30. Dip in Heatbath water-soluble oil. This leaves a slight oil film on cases to prevent hard water marks or stains, or fingerprints.
31. Blow off with heated air. (Fan blows past steam coils.)

Fig. 9—Nickel plating section of automatic plating machine. Electropurification unit is at far right, adjacent to end of plating machine. Mixer and solution filter are in foreground.



32. Unload.
33. Replace rack on plating machine for stripping. Chromium is removed from rack tips and exposed areas during dip in concentrated hydrochloric acid.
34. Cold water rinse.
35. Hot water rinse.
36. Empty, stripped rack is removed and replaced with rack loaded with parts to be plated.

Nickel and Chromium Plating Process and Equipment Details

When lighters with all surfaces bright are to be plated, the satin-bright nickel solution is pumped out and a full-bright nickel solution is pumped into the nickel tank. This change in solutions is made only once during a two-week period.

Karbate immersion heaters and Trerice temperature controls keep the nickel solution at the desired temperature. The nickel solution circulates through an Industrial filter, using Johns Manville Supercel as filter aid. The filtration and circulation system is made of plastic pipe, rubber hose, and a rubber-lined pump.

Electrolytic purification is carried out continuously in a tank (Fig. 9) adjacent to the bright nickel section of the automatic plating machine. In this unit, zinc and copper impurities are plated out on

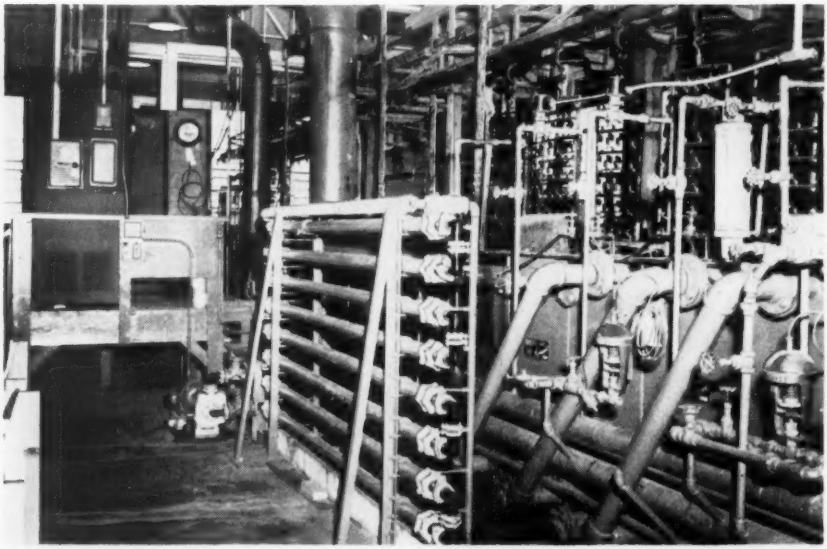


Fig. 10—Chromium plating area of automatic plating machine, showing Pyrex glass heat exchanger which maintains uniform temperature of chromium solution. Trerice temperature controls are in right foreground. Rectifier and controls are in left background.

strip cathodes at 3 to 5 a.s.f.

Racks of nickel plated parts enter the chromium plating tank charged. When the rack of parts is completely immersed, a full-load current is imposed (automatically). The electrical load is then transferred automatically to the plating rectifier and plating continues.

The chromium plating solution is 1400 gallons in volume. Round lead anodes (Metal and Thermit) are used. Udylite Zero Mist H. T. in the solution keeps fumes at a minimum.

The chromium plating solution is circulated continuously through a Corning Pyrex glass heat exchanger (Fig. 10) at 4200 g.p.h. by a Duriron pump. Pyrex glass pipe is used to connect the heat exchanger, pump and plating tank. Steam (245 deg. F.) is fed automatically into one section of the heat exchanger as required to maintain the desired chromium solution temperature. Continuous circulation keeps the solution temperature uniform and helps keep the solution composition uniform also.

Power for nickel plating is provided by a Udylite selenium rectifier. Each electrocleaner is powered by a separate rectifier. Power for chromium plating is furnished by another rectifier. To charge racks entering and leaving the chromium plating tank, a 6-volt rectifier of 300-ampere capacity is used.

Tanks in the automatic plating machine containing acid solutions or acid rinses are Koroseal lined.

Three exhaust systems made from plastic duct work remove steam and fumes from the plating machine. One system exhausts some cleaner tanks and acid tanks; capacity, 9100 c.f.m. Another system exhausts the balance of the cleaner and acid tanks; capacity, 8600 c.f.m. The third system exhausts the chromium plating tank; capacity, 135 c.f.m. Fumes are removed through overhead pipes.

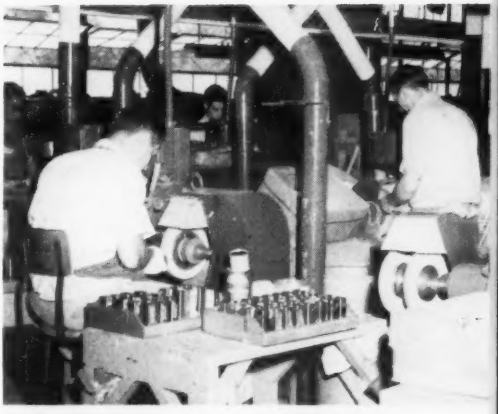


Fig. 11—Skilled operators buff lighters of special design by hand when quantity involved does not justify the design of a special automatic buffing setup.

Specialty Finishes

Table lighters are made of zinc die cast parts. These are buffed (Fig. 11), then copper plated in a small cyanide copper tank and then nickel and chromium plated on the automatic plating machine. Stainless steel lighter "inside units," which will be used in Zippo 14-carat solid gold cases, are gold plated in a Sel-Rex 14-carat gold solution.

Quality Control

To keep all plating and processing solutions at peak efficiency, chemical analyses of all solutions are run each day in the well-equipped chemical laboratory (Fig. 12). Necessary adjustments to each

"All rinse tanks are spray-dip combinations and are counter-flow."

solution are made immediately. Nickel plate thickness is checked regularly on a Kocour electronic thickness tester. Plating tests run as further solution controls are performed in a Hull cell.

Waste Treatment

All plating room rinse water and other waste is treated before being discharged to a sewer in a compact waste treatment installation (Fig. 13) designed by Infilco, Inc., and the Udylite Corporation. The waste treatment system really begins with the automatic plating machine. All rinse tanks are spray-dip combinations and are counter-flow. This results in more efficient rinsing and keeps rinse water volume at a minimum. A further control of rinse water volume is accomplished through the use of Fischer and Porter flow meters on all rinse tanks. This aids in providing a uniform flow of rinse water and regulates the volume of waste to be treated. Volume of waste treated varies from 10,000 to 14,000 gallons each eight hours.

Rinse water containing acid, alkali, or nickel runs into a common collecting pit. Chromium rinse

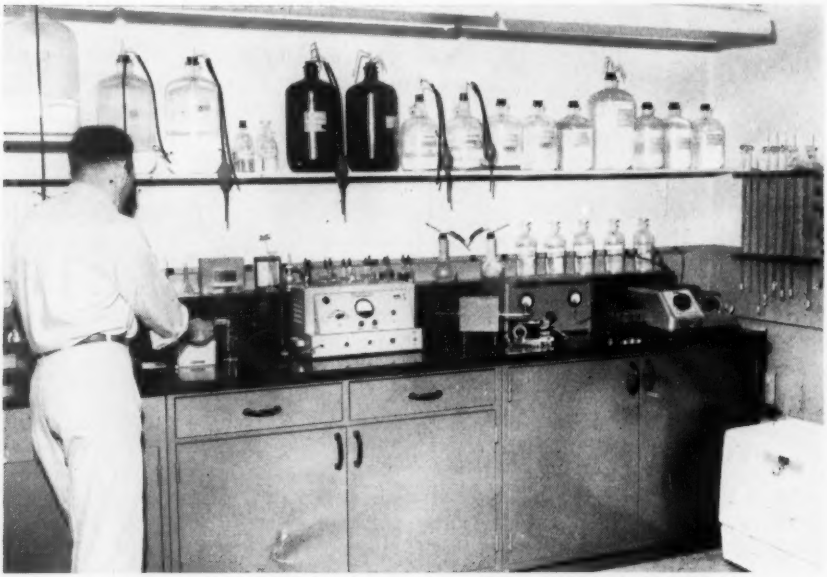


Fig. 12—Well-equipped chemical laboratory controls process solutions and quality of electroplated coatings. Plating solutions are analyzed daily, adjustments made immediately.

waste is treated separately. Cyanide-contaminated waste is very small in volume and it is batch-treated with sodium hypochlorite, and is pumped into the Accelator at a pH between 8.5 and 10.5.

Chromium waste is reduced by low pH sodium hyposulfite and then flowed into the Accelator (Fig. 13) at a pH of 2.5. The pH of waste containing nickel, acid, and alkali is 3.5, and this waste is flowed into the Accelator. Lime and calcium carbonate are pumped into the Accelator automatically, the pump being actuated by a Minneapolis-Honeywell pH recorder-controller and a Beckman pH meter.

In the Accelator, the pH of the mixed waste is raised, the heavy metals (nickel and chromium) are precipitated, and the acids are neutralized. Liquids leave the Accelator at pH 9.0 and enter the stream at pH 9.0 with impurities removed.

Sludge forming in the Accelator is pumped to sand filter beds. Filtrate from these beds is returned to the Accelator. Sludge from the sand beds is hauled away and buried.

★ ★ ★

ACKNOWLEDGMENT

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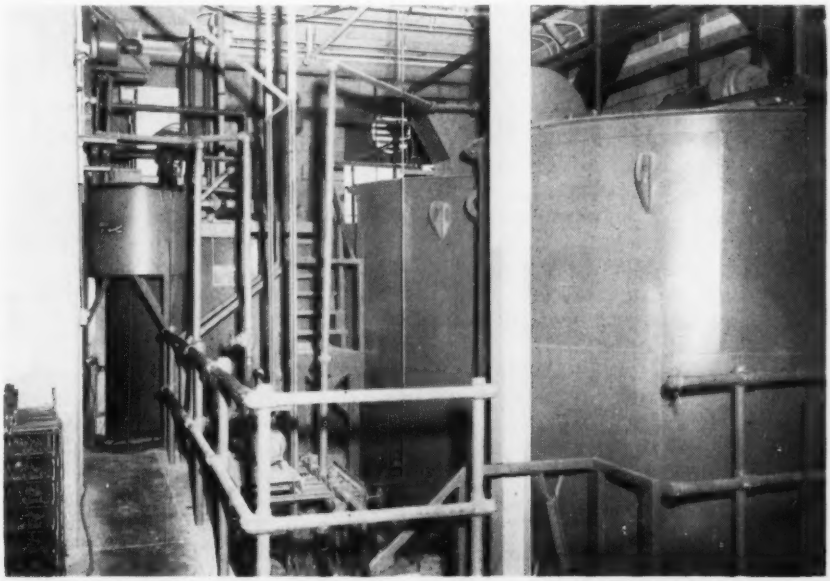


Fig. 13—Compact, efficient waste treatment system is installed in one section of plating room, making close control and efficient operation possible. (Photos by PRODUCTS FINISHING.)

Those Versatile Vinyls

Plastisols, organosols and sheet vinyl: who applies them and how . . .

By GERARD H. POLL, JR.
Associate Editor

Sale of vinyl resins for paints and coatings will total more than 85 million pounds this year. That's 30 per cent over last year and the highest since vinyls appeared on the market. What's more, vinyl-resin sales for coatings will reach 130 million pounds annually by 1963, according to H. W. Greenhood, market manager for Union Carbide Plastics Co., Division of Union Carbide Corporation, a producer of vinyl resins.

The reason for the vinyls' (chemically they're polymers and copolymers of polyvinyl chloride) growing popularity is that increasing numbers of finishing engineers and corrosion engineers want to make use of one or more of the properties in which vinyl coatings excel:

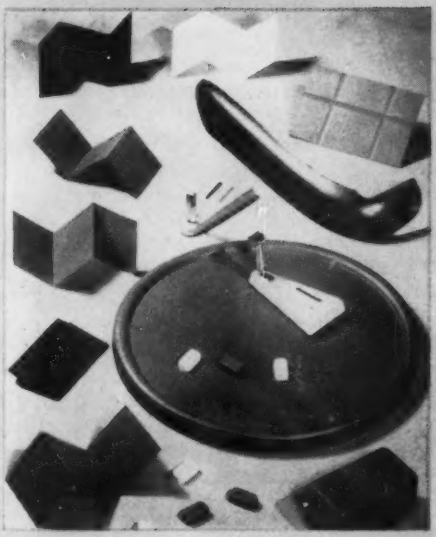
- Abrasion resistance — they're as tough as flooring.
- Chemical resistance—vinyls protect plating racks from severely corrosive solutions.
- Toughness, tensile strength, adhesion—vinyl-coated sheets withstand most standard forming operations without damage to the coating.
- Ability to protect metal from corrosion—the heavy coatings possible give sure protection.
- Electrical and thermal insulating ability.
- Ability to soften the cold, hard feel of metal with a warm-to-the-touch, resilient covering.
- Possibilities of pattern and texture —leather grains, wrinkle and spatter patterns, and so on.
- Ability to produce unusually thick films.
- Ability to deaden sound.
- Resistance to staining.
- Heat resistance.
- Resistance to water, dirt, grease, oxidation, solvents, weathering, moist and corrosive atmospheres.

Vinyls can be found on surfaces as different as plating tanks and television cabinets. They are used extensively in both utilitarian and decorative applications. They've helped the metals industry to regain markets taken by plastic and wood competitors. A list of typical applications is given in Table I.

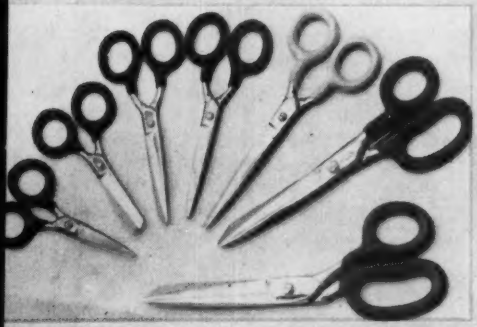
Coatings for these many products are applied in several ways. In all cases, however, the chemical compositions of the coatings are similar. But the form in which the coating material is used and the appearance produced vary widely.

Vinyl coatings can be classified broadly according to how they're

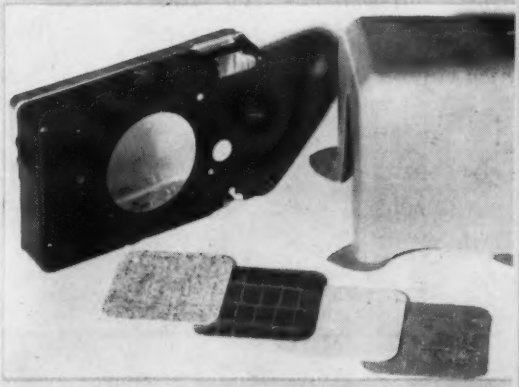
3 ways of making vinyl-coated products



STEEL COMPANIES ROLLER COAT SHEETS AND COILS of steel with vinyl, sell these to the fabricator. Parts are then formed from the prefinished metal. No further finishing is required. Deep drawing such as is required to make box in right foreground does not harm the coating. (Photo courtesy U.S. Steel Corporation, Pittsburgh, Pennsylvania).



MANUFACTURER APPLIES PLASTISOL COATING on handles of these scissors in his own plant, after scissors are made. Coating makes comfortable grip, soft and resilient to the touch. (Photo courtesy Union Carbide Plastics Co., Div. of Union Carbide Corp., New York.)



LAMINATORS ATTACH SELF-SUPPORTING SHEETS OF VINYL to flat sheets of metal by using special adhesives and pressure. Fabricator then takes these coated sheets, forms them into products such as are shown in background. Panels in foreground show some of the textures available. (Photo courtesy Stanley Chemical Company, East Berlin, Conn).

applied and who applies them:

1. Plastisols and organosols applied by the fabricator to products already formed.
2. Plastisols and organosols applied to flat sheets by large producers who sell to fabricators—U. S. Steel's coated sheets and coils, for instance.
3. Self-supporting sheets of vinyl plastic laminated to flat sheets either by companies who specialize in laminating or by the fabricator.

Both of the latter groups depend upon the ability of vinyl coatings to withstand forming operations after the coating is applied. The user takes flat sheets already covered with a vinyl coating, forms them into the proper shape for his product.

Let's examine these methods and materials in detail and see how each coating is produced, what it will do.

Plastisols and Organosols—Applied by the User

Plastisols and organosols are liquids which can be applied by dipping, spraying, roller coating and

Table I

TYPICAL APPLICATIONS FOR VINYL-COVERED METAL*

Home and Consumer Goods

Awnings
Bicycle Saddles
Camera Shells
Card Tables
Chairs
Clothes Hampers
Cutlery Drawers
Dish Drainer Baskets
Dishwasher Baskets
Gutters and Downspouts
Lawn Furniture
Luggage
Refrigerator Shells
Scissor Handles
Shower Stalls
Siding
Sinks
Table Tops
Tool Handles
Toys
Wall Panels

Transportation Equipment

Battery Clamps
Ceiling Panels for Busses
Dashboards
Door Panels
Exterior Panels, automobile
House-Trailer Interiors
Automotive Interior Trim
Marine Accessories and Hardware
Railroad Car Interior Panels
Railroad Freight Cars
Seat Backs
Station Wagon Floors
Steering Wheels

Office

Business Machine Housings
Chairs and Tables
Desk Tops
Doors
Partitions
Tape Dispensers
Wall Panels

Industrial

Conveyor Baskets
Exhaust Ducts, Hoods, Fans
Handrails
Plating Racks and Tank Linings
Racks for Delicate or Polished Parts
Sandblast Barrels
Tumbling Barrel Linings

This is not intended to be a complete list of the many uses for vinyl coatings. It is merely a cross-sectional sample of the many possible ways in which vinyl-covered metal can be used. No attempt is made to classify by coating method. In many cases more than one method is feasible.

slush coating. They produce coatings as soft as the "rubbery" coating found on scissor handles or as hard as the textured coating that protects office machines.

What are Plastisols and Organosols?

Plastisols are composed of vinyl resin dispersed in a plasticizer. They contain nothing else except small quantities of stabilizers.

Organosols contain these same ingredients, but are thinned with volatile solvents, which evaporate from the film prior to curing.

To compare the characteristics of plastisols and organosols: Plastisols are 100 per cent solids—no volatile diluent to adjust viscosity. Thus heavy films can be applied in a single application without fear of cratering caused by solvent escaping from the film during the baking process. Organosols, on the other hand, can be reduced to a much thinner consistency. They are easier to spray, but applying too heavy a film in a single application can cause "cratering" as solvents are driven from the film during baking. Therefore, plastisols are generally applied where maximum film thickness is required, (especially when dip application is possible) while organosols are more frequently used to produce thinner films where appearance counts (especially for spray application).

With both plastisols and organosols the vinyl film is formed by coating the article with the liquid dispersion, then fusing the tiny particles of plastic into a continuous film by application of heat.

Metal Preparation

Before any plastisol or organosol is applied it is necessary to prepare

Fig. 1—Primer coat for plastisol is sprayed on interior of fume washer section. Special primer is used. (PRODUCTS FINISHING Photo.)

Fig. 2—This marine anchor is finished with zinc chromate primer and a dip-applied orange plastisol. Coating successfully resists corrosive sea water, has surface-slip characteristics that help when the user is cleaning off mud. It resists abrasion of dragging on sandy bottoms. (Photograph courtesy Stanley Chemical Corporation, East Berlin, Conn.)

"... some type of primer is required to obtain good adhesion."

the metal by conventional cleaning and chemical-treatment methods. If it is impractical to clean and phosphatize, the metal should be thoroughly sandblasted. Then a special primer is applied, allowed to air dry for 5 or 6 minutes, and baked at 385 deg. F. for six to 20 minutes, depending upon the product, its mass, thickness, and so on. In certain applications where outdoor exposure resistance is not required, an air-dry primer may be satisfactory.

In most cases, however, *some type of primer is required* to obtain good adhesion. Without it, plastisol coatings actually can be used as easily-strippable temporary protective films for such applications as stop-offs in plating operations and for protecting polished surfaces. Special primers, such as zinc chromates, are available for use beneath plastisols where maximum corrosion resistance is required.

Application Methods

Having a clean, primed product, it is possible to apply plastisols and organosols in several ways.

Plastisols—Dipping. Most industrial applicators apply plastisols by this method when the size and shape of the object to be coated makes it possible, especially if meticulous appearance isn't a consideration.

• *Preheat Method.* Liquid plastisols gel at comparatively low temperatures. You shouldn't store them at temperatures above 90 deg. F. This property is useful when maximum coating thickness is required. The object is heated before being dipped into the plastisol, then heat remaining in the object gels plastisol immediately surrounding contours of the object; coating thickness is proportional to the total amount of heat available.

Total amount of heat available for gelling depends upon the temperature of the object when it's dipped, its size and mass, length of immersion, and temperature of the plastisol in the tank. Longer immersion produces thicker coatings, but may also increase drain time required before curing can begin.

It is often possible to use the heat remaining from baking the prime coat as a substitute for a separate preheat. The primer is baked at 350 to 385, and therefore the primed object still is over 300 deg. F. when it enters the plastisol—if the object is immersed immediately after emerging from the oven.

Dipping tanks for plastisol should be equipped with recirculating pumps and a weir or dam for overflow to purge the viscous material of trapped air bubbles.

In tanks used continuously for hot dipping, cooling mechanisms may be necessary to lower the temperature of the plastisol. Temperature can sometimes be controlled satisfactorily by adding new, cold material as temperature of the plastisol rises.

Rate of immersion and withdrawal must be slow (4-6 inches per minute) to avoid trapping bubbles in the viscous plastisol.

• *Draining.* When the desired film thickness has been built up (up to 3/16 inch in a single dip) the object

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is withdrawn from the tank of viscous material. Excess material is allowed to drain off. Sometimes inverting the object for a short time improves uniformity of the coating.

• *Fusion.* Any plastisol dispersion must be fused into a continuous film by heating until the coating reaches fusion temperature. This is the temperature at which the plastisol particles dissolve in the plasticizer. Once this temperature is reached, products can be removed from the oven in a relatively short time.

Actual temperatures required for curing vary from 350 to 400 deg. F. Time required in the oven: from five minutes to as long as two hours.

How do you know when the coating is completely cured? The amount of heat needed depends upon the size and thickness of the object, the thickness of the coating, and the type of oven. A small, flat object can be cured in five minutes. Large, contoured, thick objects may take hours to cure, since it takes more heat for a large mass of metal to rise to the temperature required for curing.

There are several ways to determine time and temperature required for curing any given part. Some plastisols are formulated to change color slightly as an indication that curing temperature has been reached. Pyrometer measurements can be helpful in determining exactly how long it takes to cure a given object in a given oven. A less exact indication of curing is the appearance of dense smoke given off as curing temperature is reached and exceeded.

• *Protecting from chemicals with hot-dip plastisols*: plating racks and other articles exposed to corrosives are among the products coated by hot-dipping methods. Toughness and chemical resistance are the outstanding qualities contributed by such coatings.

In a typical application of plastisol plating-rack coatings, the primer is baked for 20 minutes at 375 deg. F. Preheats range from 275 deg. F. to 600 deg. F.

Parts that must have maximum chemical resistance are sometimes dipped two to four times, with bakes between each application. The final coating is baked at 375-380 deg. F. for 1¼ to 2 hours. In most cases, one or two coats give sufficient protection.

Another example of an application in which a dip-applied plastisol is outstanding in protecting purely functional items is the plastisol-coated conveyor basket. In this application the plastisol coating protects the basket from corrosion and chemicals, and, perhaps even more importantly, protects highly finished or precision-

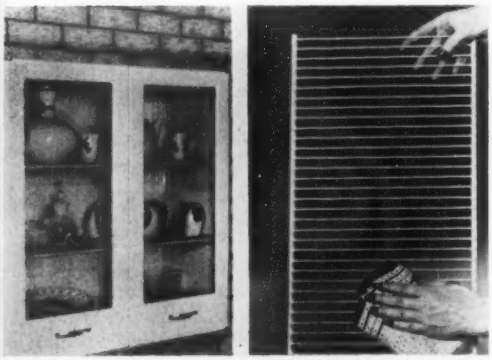


Fig. 3—Plastisol coating on this steel shelf for a kitchen cabinet helps to protect china and glassware from breakage. It also deadens sound, makes cleaning easier. (Photo courtesy Union Carbide Plastics Co., Div. of Union Carbide Corporation, New York, New York.)

Interstate Gets a Higher Quality Finish and Paint Mileage is More Than Doubled with

RANSBURG

NO. 2 PROCESS ELECTROSTATIC SPRAY PAINTING

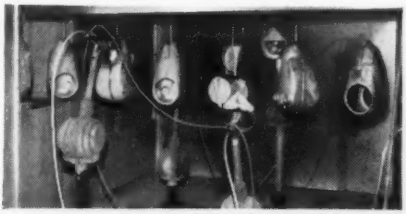
in finishing

COMPACT
VACUUM CLEANERS

Interstate Engineering Corporation in Anaheim, Calif. switched from hand spray to Ransburg automatic Electro-Spray in the painting of their quality line of home renovating products: The COMPACT vacuum cleaner . . . the POLISH-AIRE floor polisher . . . and MAGIC DISC carpet and rug sweeper.

RESULTS? Quality of the painting improved, for with former hand spray, rejects used to run as high as 10%. That's because of Interstate's high quality standards. Now, with Electro-Spray, rejects are cut to less than 2%! This alone would have justified the change, but Ransburg Electro-Spray also provides substantial labor and material savings. One operator now does the work of two. And, with the former method, Interstate was painting only 28 sets of parts per gallon of paint. Now, they get 57 sets of parts per gallon. Think of what 50% savings would mean in YOUR finishing department.

NO REASON WHY YOU CAN'T DO IT, TOO!



Vacuum cleaner parts are painted with wrinkle enamel as they pass through the electrostatic spray painting area in the finishing department at Interstate Engineering Corp. Unpainted parts, entering from the right, are coated uniformly by the two Ransburg atomizing bells on either side of the line.

Let us show YOU and test-prove the advantages of automatic electrostatic spray painting on YOUR products in our complete laboratories. Call or write for our No. 2 Process brochure which shows a variety of automatic painting installations on a wide variety of products in both large and small plants. Or, if your production doesn't justify automatic painting, let us tell you about the new No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized, or non-conveyorized painting.

Call or write

RANSBURG Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

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"In the absence of heat, thickness is proportional to the viscosity of the plastisol."

tolerance parts from scratching and abrasion. The soft, resilient quality of plastisols prevents mechanical damage.

Cold Dipping. Coatings ranging from a few mils to as thick as 60 mils can be applied in a single cold dip. In the absence of heat, thickness applied is proportional to viscosity of the plastisol. Depending upon configuration, it may or may not be advantageous to invert the coated article before curing.

Wire racks used in automatic washers to prevent small articles from being forced over the top of the spinning tub are typical of the articles that can be coated by cold dipping. These coatings are usually about 0.015 inch thick. Curing of such parts takes place at 385 deg. F., requires only nine minutes.

Spraying Plastisols

Specially formulated low-viscosity 100-per-cent-solids plastisols can be sprayed by using an internal-atomization spray gun. These plastisols can be thinned by adding up to five per cent volatiles without danger of the film blistering during curing. Large tanks, ducts, hoods, and other industrial equipment are coated in this manner.

Plastisol travels to the gun through a ¾-inch line under 250-350 p.s.i. pressure. Atomizing air is delivered to the gun at 100-120 p.s.i. Heavy-duty fluid tips with ⅜-inch openings are used.

Wet thickness of each plastisol coating is 20 to 60 mils. Two or three coatings are sprayed on, curing at 370 to 380 deg. F. between each application. The final curing cycle is 2 to 3 hours at 385 to 390 deg. F. Total thickness of the dry film: 60 to 80 mils.

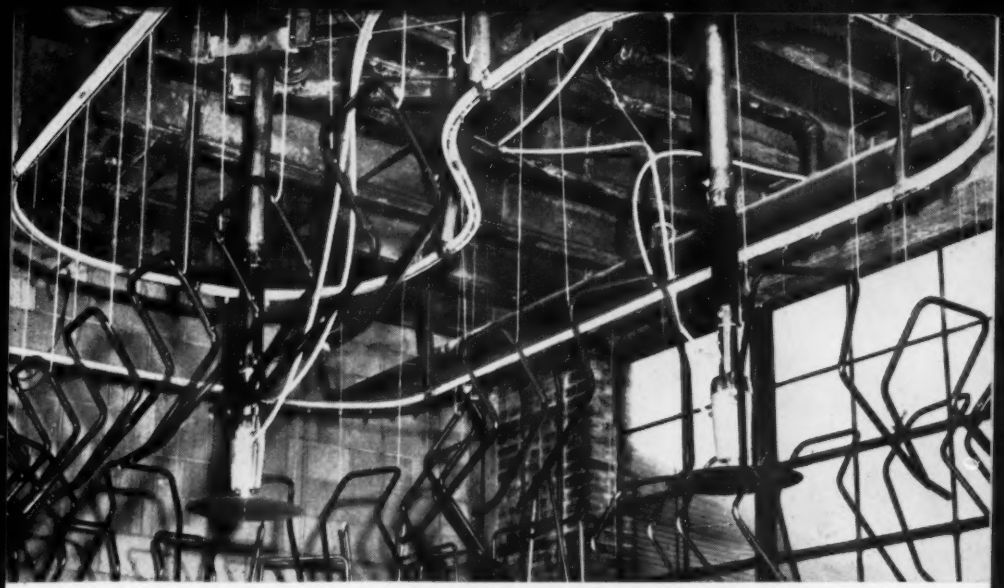
● *Wrinkle Plastisols.* Specially formulated plastisols are available, which, when applied by the correct technique, produce a wrinkled vinyl finish. These finishes are spray applied in the usual manner except for the following variations, which must be followed to achieve a wrinkled finish with desirable appearance:

1. Apply a maximum of 12 mils (wet film thickness) and a minimum of 6 or 8 mils. Less than 6 mils gives little or no wrinkle, over 12 mils produces a coarse, non-uniform wrinkle.
2. The sprayed article must be allowed to air dry for 10 minutes before baking.
3. Temperature control is important in curing. Baking for 8 minutes at 375 deg. F. is sufficient to cure the average article. Temperatures below 375 deg. F. produce little if any wrinkling. Air circulation should be rapid.

Wrinkle plastisols should not be used on products for outdoor service. They have excellent appearance and good abrasion resistance in indoor service, however.

Slush Coating—Plastisols. Slush coating is a useful method for lining containers with vinyl coatings. The procedure is similar to dipping in that the article to be coated is first primed, then baked, and while the article is still hot, the plastisol is applied. But in this case the plastisol is merely poured into the container.

For more data on advertisement on opposite page, circle 324 on Postpaid Card ——→



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through integrated processing!

The Chainveyor overhead conveyor system used in this complete finishing process for metal furniture eliminates in-process handling and utilizes the full potential of integrated processing.

A continuous flow of unfinished parts through pre-paint cycles and bake oven, is accomplished without costly intermediate manual transfer. The versatility and adaptability of the Chainveyor system for close tolerances and critical distances between conveyor curves and spinning paint discs, are credited with superior quality finishing and a substantial reduction in rejects.

Added flexibility is gained through the use of 6-inch load spacing and a variable speed drive. Job Shop operations assume the characteristics of continuous high production runs. Increased floor space results from the placement of the bake oven and cooling loop near the ceiling.

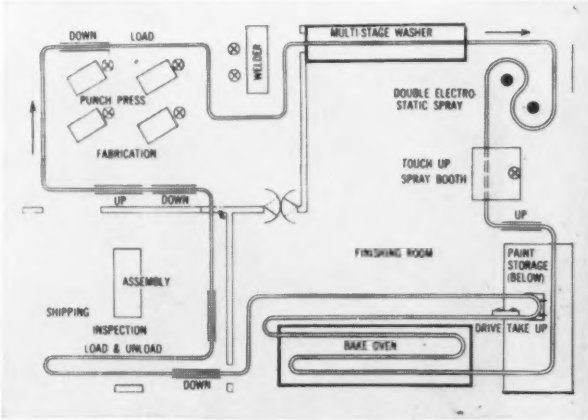

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Fig. 4—Plastisol-coated wire products just out of the dip tank are inverted momentarily to eliminate beads before entering the infrared oven for curing. (PRODUCTS FINISHING photo.)

It remains in the container until the plastisol gels to the desired thickness, then the excess is poured out. The coating or lining is cured in the usual manner. Linings for tumbling barrels can be applied in this way.

Organosols—Spraying. Organosols are usually spray applied, although other coating methods are feasible. Most often they're found on fabricated metal products where a thinner coating with good appearance is required. Since they are lower in viscosity than plastisols, spray application of a film with good appearance is much easier.

Various types of organosols are available to produce different textures. Virtually any color can be produced.

Application procedures for producing the various textures differ slightly, but the basic process is the same for all. The applicator cleans and

To page 50→

Fig. 5—Operator hangs plastisol-coated battery retainer rings on conveyor which will take them to the curing oven. Preheated rings, ready for dipping into plastisol are just emerging from the oven in right background. (Photograph by PRODUCTS FINISHING.)

NOW...

your UDYLITE nickel brighteners come in this new RIP-OPEN PACKAGE for greater speed and SAFETY!

This new Udylite carton provides you with a handy replaceable lid that fits snugly back on the box to keep out dirt and protect the remaining bottles.

This new Rip-Open packaging, just introduced by Udylite, is typical of the attention we feel is due small details. Speedy and easy is the opening job when, with a roundhouse *rip* of the tear-off strip, your carton of Udylite brightener containers is open . . . neatly and evenly.

Here is one more example of why it pays to deal with Udylite—where you can be sure of getting first rate plating supplies of a quality and price that you know you can depend upon. And always at Udylite you find the respect for fine points of performance that makes this the finest plating supply service. If Udylite isn't already your source, investigate now the advantages of dealing with

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world's largest plating supplier

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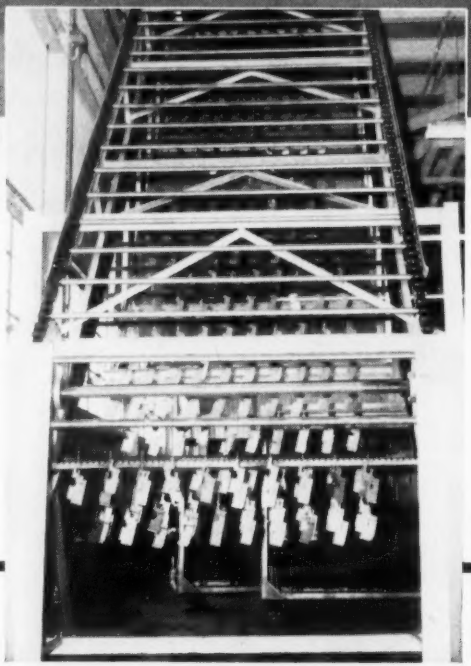
FINISHING SYSTEMS

. . . the **EXPERIENCE** that goes into the **PLANNING** and **ENGINEERING** of **MAHON EQUIPMENT** is the item of **GREATEST VALUE** to **YOU!**

The Eight-Foot-Wide Continuous Crossbar Conveyor carries a variety of products and a great mass of small parts through all Processing Units of the Dip Coating System. The Crossbars of the Conveyor are designed for a work load of 250 lbs. Load and Unload Stations are on the Ground Floor Level.



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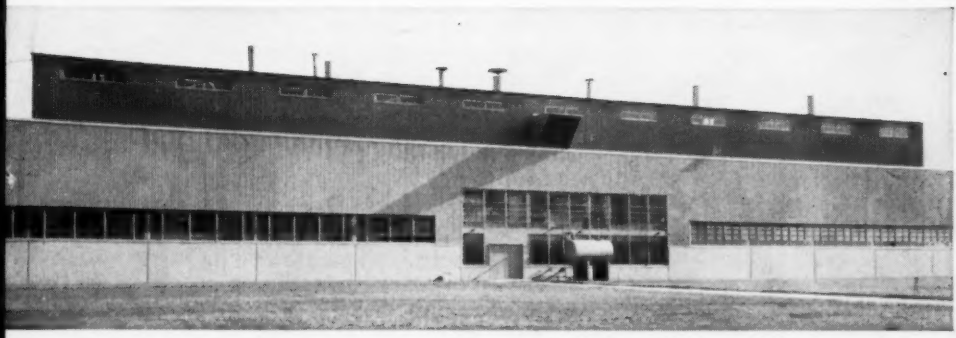


Complete Mahon Installation Provides Compact Facilities for Dip Coating and Spray Painting in CUTLER-HAMMER'S Lincoln, Ill. Plant

In this unique finishing system, the greater part of which is located on the roof, Mahon engineers have employed what is probably the longest continuous crossbar conveyor ever designed into equipment of this type.

The painting enclosure shown at left is inside the large electrical plant. It is divided into two sections, one of which has a paint mixing room on the ground floor and paint Dip Tanks on a mezzanine floor above. The other section houses two Spray Booths and a Batch-Type Finish Baking Oven. The conveyorized, Five-Stage Metal Cleaning and Rust Proofing Machine, Dry-Off Oven, Finish Baking Oven and Filtered Air Supply Equipment are housed in one Mahon-built enclosure located on the roof of the plant—see above.

This is the third complete finishing system installed by Mahon in Cutler-Hammer Plants across the country.

If you have a finishing problem, or are contemplating new finishing equipment, you, too, will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the initial planning and engineering which is so important in specially designed equipment of this type.

See Sweet's Plant Engineering File for Information, or Write for Catalogue A-660

THE R. C. MAHON COMPANY • Detroit 34, Michigan

BRANCH OFFICES in NEW YORK, CHICAGO, LOS ANGELES and SAN FRANCISCO

MAHON

"The resulting finish is a pebble-textured coating with good resistance to abrasion, staining, fingerprinting . . ."

primes the metal, bakes the primer, allows time for cooling, then sprays on the organosol. Air drying for 3 to 7 minutes is followed by baking at 200 deg. F. for 5 to 7 minutes, then curing for 10 to 15 minutes at 350 deg. F. The initial low-temperature bake drives off the volatile solvents before curing begins.

A typical example of a sprayed organosol finish is the one IBM applies on the covers of its business machines. The resulting finish is a pebble-textured coating with good resistance to abrasion, staining, fingerprinting and general wear and tear of office use.

The IBM finish begins with a five-stage cleaning and phosphatizing cycle. This is followed by application of an air-dry primer. After a brief "flash-off" period for the solvents to evaporate from the primer, the first coat of vinyl (viscosity: 45 seconds in a No. 4 Ford Cup) is sprayed on. A six-minute bake at 200 deg. F. follows one-minute air-dry time to evaporate solvents from the organosol. Then the second coat of organosol (viscosity: 90 seconds in a No. 4 Ford cup) is sprayed on.

Following a one-minute air flash, a texturing agent is sprayed over the wet organosol film. An air flash of 2

Fig. 6—Preheated frame for diaphragm plating tank is dipped in plastisol. (Photo courtesy Metal & Thermit Corp., Rahway, N. J.)

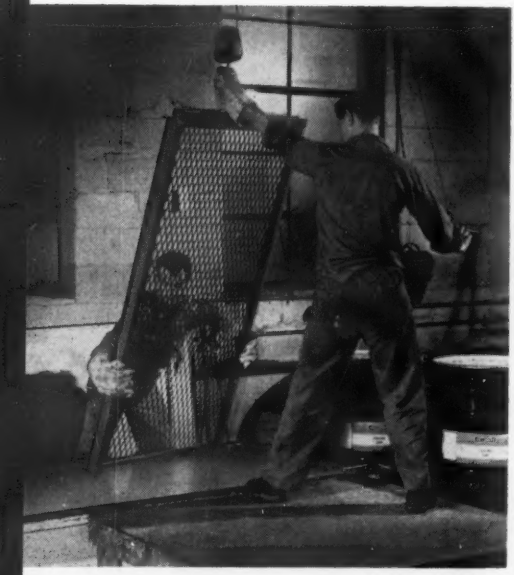


Fig. 7—Plating racks emerge from tank of plastisol. Coating protects racks from strong corrosives. (Photo by PRODUCTS FINISHING.)

minutes and baking for six minutes at 200 deg. F. evaporates the solvents from the organosol. This is followed by eight minutes curing at 350 deg. F. to cure both coats of organosol. The resulting rough-textured coating is 10-12 mils thick.

Automobile dashboards also have been coated with organosols to produce a low-reflectivity abrasion-resistant coating. In a typical application, a light-bodied organosol is sprayed on, followed by a heavy-bodied organosol applied with a special spray gun to achieve the textured effect. Curing takes place at 330 deg. F., takes 20 minutes. The resultant coating will take 96 hours in salt spray, 100 hours in the Fadeometer, 150 hours in 100 per cent humidity at 100 deg. F.

Organosols have been used with success on sections of automotive exteriors. A leather-textured coating appeared on the roof section of the 1959 DeSoto Adventurer. It had good resistance to weather and abrasion.

Organosols—Dipping. Organosols can be applied by dipping, but not as heavy a coating can be applied in a single dip as is possible with plastisols. If thicker coatings are desired, they must be applied by multiple dipping, heating the article between dips to evaporate solvents from the coating. Since the viscosity of organosols is lower, articles can be dipped more rapidly.

Stripping Plastisols and Organosols

Plastisols and organosols resist a wide variety of chemicals, have excellent adhesion (bond strength of 200 to 250 p.s.i. for plastisols) and tensile strength (2,000 to 2,200 p.s.i.). This is fine when they can stay on the product, but when rejects occur, the same properties make stripping difficult. Specially formulated chlorinated-base strippers are available to do the job, however.

Roller Coated, Prefinished Steel

The second major classification of vinyl-metal combinations is the volume-produced vinyl-coated metal sheet or coil. Several steel producers now produce coated coils and sheets, carry them as stock items.

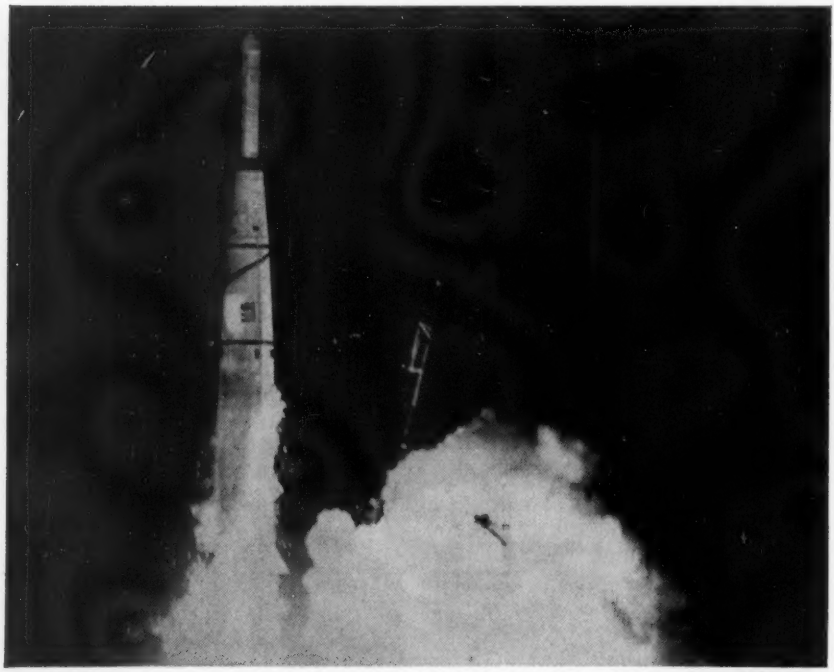
U. S. Steel recently began marketing such sheets and coils. They are roller coated with several colors of liquid vinyl at the mill. The coated sheets and coils are then sold as regular mill products. The user fabricates these coated sheets by conventional forming methods. After the

To page 54→

Fig. 8—Operator dips hot impeller for marine centrifugal pump into tank of plastisol. A 10-minute immersion builds up thick coating that gives good service. (Photograph courtesy Metal & Thermit Corporation, Rahway, N. J.)

DOW | **metal cleaning report no. 4**

case histories from your distributor of Dow solvents

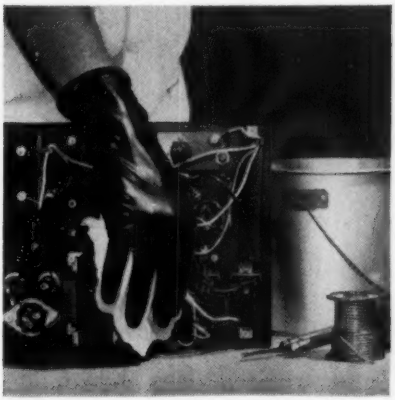


MISSILE COMPONENTS . . . no place for "almost clean"

An aircraft parts manufacturer, under sub-contract to deliver missile components, had a serious production problem. His regular vapor-degreasing solvent gave results which, at best, were not quite good enough for certain critical missile parts. As a result of a consultation with his distributor of Dow solvents, this manufacturer put NEU-TRI® to work . . . now his missile components *and* his standard line of aircraft parts come off the line thoroughly cleaned. But he also gained a cost advantage—the long-lived neutral stabilizing system built into NEU-TRI prevents early solvent breakdown. Consequently he now can clean more parts with a gallon of solvent than ever before!

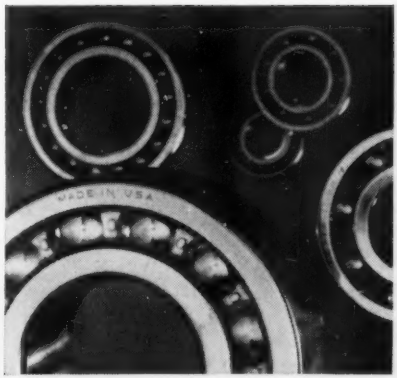
BALL BEARINGS

Teamwork for protection—This bearing manufacturer found nonflammable Dow perchloroethylene an ideal solvent for use in a combination cleaning-and-oil-bath formulation. A completed *ball-and-race* assembly, dipped in the solution, came out completely free of all dirt and contaminants deposited during manufacture and assembly . . . while retaining a thin film of oil for protection during packaging and storage.



ELECTRONIC COMPONENTS

Choice of spray or wipe—This manufacturer of electronic parts states: "Chlorothene is the finest all-around solvent we've ever used." Chlorothene is widely used throughout the plant for both spray and wipe cleaning of the electronic parts, *and* for cleaning of production equipment! There's no fire or flash point by standard testing methods, and toxicity is very low, which keeps this safety-conscious management happy.



There's no doubt about efficiency in metal cleaning operations when one or more of the Dow metal cleaning solvents is on the job. Dow offers industry the widest line of chlorinated solvents, each one designed for a specific application and purpose. There's a Dow solvent to meet every solvent-cleaning need . . . one which will do the job efficiently, in short order!

Your distributor of Dow solvents is fully qualified to assist and advise you when problems of metal cleaning arise. Why not take advantage of the wide experience and knowledge which he and his staff have to offer? A call to him may be a shortcut to more efficient, economical metal cleaning in *your* plant.

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"Thickness of the mill product can be controlled closely."

product is formed, it needs no further finishing.

The prefinished steel has a coating that is similar in chemical composition to plastisol coatings applied by the methods just described. This coating differs from the ones described previously, however, in that almost any pattern can be embossed into the heavy vinyl covering produced. Thus various decorative effects can be achieved—the appearance of leather grain, cloth, and so on. Any texture that can be engraved on an embossing roll is possible. These textures are functional as well as decorative, since the rougher textures improve abrasion resistance, hide minor scratches that occur in service. Maximum depth of texture embossing, 0.005 to 0.006 inch.

Thickness of the mill product can be controlled closely. Coatings from 0.008 inch to 0.020 inch in any solid color the user wants can be specified.

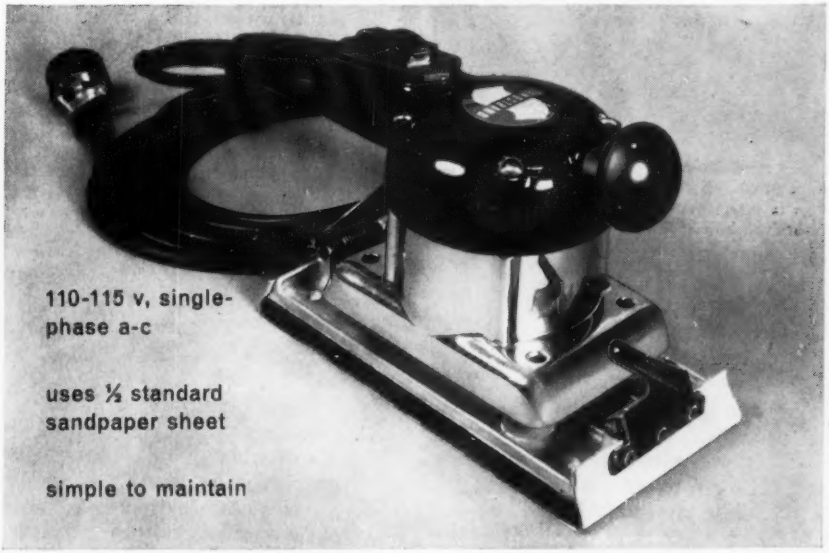
Here's how U. S. Steel applies the vinyl coating:

1. Clean, etch and phosphatize 18-28 gauge cold rolled or galvanized steel.
2. Roller coat with a thin coat of specially formulated primer.
3. Roller coat the reverse side with primer to protect from corro-

Fig. 9—Typical applications for U. S. Steel's vinyl-coated steel include chairs, room coolers, space heaters—all formed after coating.

Fig. 10—George H. Rendel, division chief, inspects plastisol ready for the coating line at U. S. Steel's Irvin Works, Pittsburgh.

Trouble-free design makes new electric sander ideal for the tough jobs



There's no need to baby Sundstrand's new Model OE 900 orbital electric sander, it's designed for continuous one- or two-hand operation on the most demanding jobs. Unique design of the single-phase motor enables the new sander to operate at constant speed on every class of work, doesn't require any belts or gears, provides high starting torque, and prevents damage due to overloading.

Simple, sturdy design of the new electric sander does not require a centrifugal switch. Commutator and brushes are another potential trouble spot eliminated by the advanced design of the OE 900. Lifetime lubricated bearings reduce the need for maintenance. For more details write for Bulletin OE 900.

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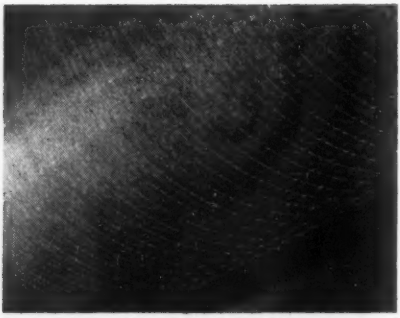

Fig. 11—Pattern on this embossing roll produces textured surface on vinyl coating. Pattern is produced by running coated sheet beneath roll before the cured coating has cooled.

sion. (This step may be eliminated if protection of the reverse side is not required).

4. Cure special primer and reverse-surface coating in an oven. The primer bonds the finish coat of plastisol to the metal.
5. Apply vinyl plastisol with a reverse roller coater, heat cure.
6. While the coated metal is still hot, emboss by passing through embossing rolls which impress designs or textures into the coating.
7. Cool, then coil or cut into sheets.

U. S. Steel buys the vinyl coating and the reverse-surface protective coating from several suppliers of plastisol coatings.

Properties

● *Adhesion.* To withstand standard forming operations (the sheets and coils can be slit, sheared, brake-press formed, stamped, drawn, die formed and roll formed without damaging the coating) U. S. Steel's product has to have excellent adhesion. To make sure that it does, the company's quality control men have devised a torturous test. To pass this test, coated sheets must retain adhesion after 30 per cent elongation followed by any one of the following treatments:

1. Immersion in tap water at 80 deg. F. for two hours.
2. Exposure to 100 per cent relative humidity at 100 deg. F. for 200 hours.
3. Exposure in a dry oven at 200 deg. F. for seven days.

U. S. Steel tested extensively to check other qualities of this coating, found that it has the following additional properties:

1. Hardness: 60 to 90 Shore Durometer.
2. Heat resistance: Withstands 160 deg. F. continuously; 212 deg. F. for two days, softens at 350 deg. F., chars at 400 deg. F.; won't support combustion.
3. Stain resistance: not stained by die lubricants, alkaline cleaners, fountain pen ink, alcoholic beverages, detergents, acid cleaners, nail polish, fruit acids.
4. Abrasion resistance: 25 minutes in a ball mill charged with unground porcelain enamel frit, which has many sharp edges, leaves coating relatively unharmed.
5. Moisture absorption: boiling water, 5 minutes, no effect.

While fabrication usually presents no problem, welding is sometimes difficult. Most manufacturers use other methods of joining.

Other steel producers are also on the vinyl-coating bandwagon. One company, National Steel Corporation, purchased Enamelstrip Corporation as an expression of its faith in the future of prefinished metal. Enamelstrip now turns out vinyl

A 3M Case History Report

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ADDRESS: Philadelphia, Pennsylvania.

PRODUCT MANUFACTURED: Automotive Metal Stampings.

3M ABRASIVE USED: "PG" Wheels.

HOW 3M ABRASIVES ARE USED: Finishing operation. Remove die marks, scratches, and other forming defects from cold-rolled carbon steel auto grille bars, prior to plating.

OPERATIONAL DATA ON 3M METHOD: Grit 220 Resin Bond Cloth "PG" Wheel on double-spindle floor lathe with buff-wheel.

OPERATIONAL DATA ON PREVIOUS METHOD: 2-station, 3-step method. 1st, #120 disc; 2nd, set-up wheel; 3rd, buff-wheel.

PROVEN ADVANTAGES OF 3M METHOD: Former 3-step operation reduced to 2 steps; "PG" Wheel and Buff. "PG" Wheel leaves no scratches on work piece; speeds production 10-15%.

OTHER 3M ABRASIVE PRODUCTS IN USE: "Three-M-ite" Resin Bond Cloth Portable "PG" Wheels on hand-grinders are used to remove in-use scratches, other imperfections from dies, without removing them from press. "PG" Wheels replaced hand methods, reduced repair time from 14 hours to 30 minutes.

WANT MORE INFORMATION? Send for free manual, "Modern Metal Finishing with 3M 'PG' Wheels." Write to 3M Co., St. Paul 6, Minn., Dept. ABE-129.

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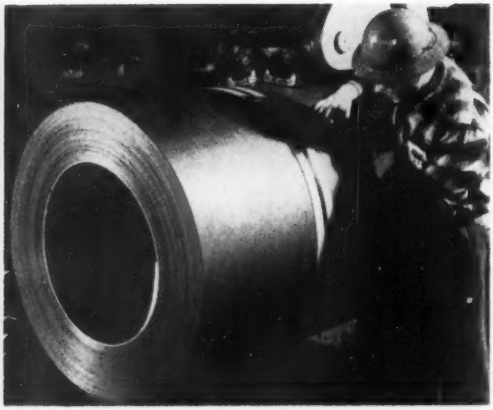

Fig. 12—Roll of vinyl-coated steel ready for shipment to fabricator. (Photos for Figs. 9-12 courtesy U. S. Steel Corporation, Pittsburgh.)

coated steel by roller coating methods, is expanding to increase production of vinyl coated and other prefinished metal. Sun Steel Company sells steel, aluminum and magnesium sheets and coils vinyl finished by reverse roller coating. They emboss both the steel and the metal for certain applications where a lighter gauge is desired. Embossing the metal improves rigidity.

Vinyl-Metal Laminates

The third major classification of vinyl-metal combinations is the laminated vinyl-metal sheet.

The basic method of producing these sheets is simple. Self-supporting vinyl sheets are merely attached to the metal sheets with an adhesive.

The product resulting from laminating is virtually the same as that produced by U. S. Steel's method, in that it is a vinyl film securely attached to a flat sheet of metal, exhibiting the properties of vinyl finishes.

Vinyl-metal laminates also can be shaped and fabricated by virtually any metalworking technique without damage to the plastic facing.

Like the USS product, vinyl-metal laminates are available with various surface textures to give the appearance of other materials — leather, cloth, and so on. But unlike the steelmaker's prefinished metal, which is now available only in solid colors, the laminates can be obtained in an almost unlimited selection of colors and textures. Almost any of the many types already stocked by the makers of vinyl plastic sheeting can be attached to metal—and to various nonmetallic surfaces as well. The laminates offer the widest choice of colors and textures to designers.

How It's Done

The first prerequisite for bonding vinyl to metal is a clean metal surface. Phosphatizing helps to prepare the surface.

After the sheet is cleaned and phosphatized, adhesive is roller coated to a thickness that will produce a dry film of adhesive 0.0003 to 0.0005 mil thick. The coated sheets are then

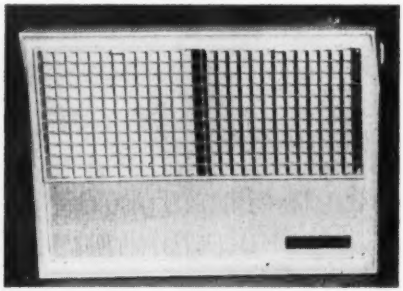

Fig. 13—Decorative panels on this Travel-Aire dehumidifier are vinyl-coated steel. 12-mil vinyl is laminated to 0.015-inch steel. Cabinets themselves are also fabricated from vinyl-coated steel. (Photo courtesy Arvin Industries, Incorporated, Columbus, Indiana.)

heated to 400-410 deg. F. for two to four minutes. The bond is secured by passing the vinyl-clad sheet through a nip roll. Finally, the laminate is quenched in cold water as it leaves the roll, to guard against blistering.

The laminates don't take a back seat for general resistance to abuse. They can take severe elongation and bending without losing adhesion. Their resistance to abrasion, moisture and chemicals is a function of the vinyl material, and thus is excellent.

Vinyl-metal laminates are made to withstand forming operations without damage. Standard forming methods don't harm the coating, and all that's required after forming is a good cleaning to remove dirt and lubricants. Cleaners are available to do the job quickly without damage to the coating or bond.

Conclusions

Vinyl-covered metal attains greater importance every year. It is useful in purely functional industrial applications such as plating racks, and in applications where appearance really counts—appliances and automotive.

There are three principal ways to obtain vinyl covered metal: you can apply the coating in your own plant; you can buy steel from the mill with a vinyl coating already in place; or you can buy sheets of vinyl-metal laminates from companies who specialize in attaching self-supporting vinyl films to metal with special adhesives and pressure.

The application method that is best depends upon the product, service requirements, economics, the user's plant facilities, and the appearance desired. But whatever method is used to obtain the vinyl-metal combination, the product can be expected to have outstanding resistance to abrasion and to a long list of corrosive chemicals and moisture, and to give a warm, textured quality to metal that changes its traditional cold, hard surface.

These outstanding properties lead to optimistic predictions for the future of vinyl-coated metals. Edward B. Osborne, a market manager for B. F. Goodrich Chemical Co., recently described the vinyl-metal combination as one that promises to "revolutionize the manufacturing and marketing processes of scores of consumer products." Mr. Osborne made his remarks before the National Metal Congress recently held in Chicago.

The movement toward vinyl-coated metals has become commercially important in just the last year, Mr. Osborne pointed out. More than 30,000,000 square feet of vinyl-coated metal sheets and coils were produced in 1958, and this is expected to rise to 50,000,000 square feet in 1960, he reported.

Noting that use of vinyl is impossible only when high temperatures are involved, Mr. Osborne said that vinyl-coated metals should be able to capture a sizeable share of the market for enameled steel—estimated at more than one billion square feet annually.

In the following large markets, vinyls are extremely promising, he said: appliances—175 million square feet of coated metals in 1958; kitchen cabinets—approximately 30 million square feet of coated metal per year; office equipment—4.5 million square feet; luggage, 75 million square feet. Vending machines of all types are also good possibilities, accounting for another four million square feet, Mr. Osborne estimated.

Barrel Finishing: Materials and Techniques for Precision Results

Part I of an article on materials and techniques for achieving precision control of barrel finishing . . .

- **Media**
- **Compounds**
- **Solution Level**
- **Loose Abrasives**
- **Barrel Speed and Cycle Time**

Recently a Long Island manufacturer purchased a special machine that turns out precision gears quickly and at comparatively low cost. It hobs gears to tolerances as close as 5 millionths of an inch consistently, for only pennies each. But removing burrs left by this machine was expensive. The cost of hand deburring cancelled most of the savings possible with the new machine.

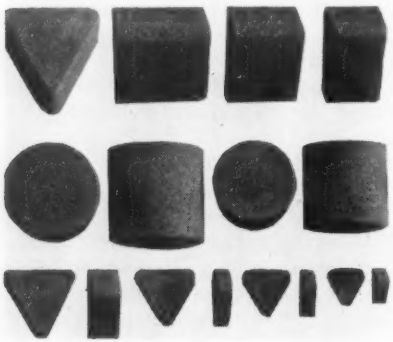

Fig. 1—Specific-shape abrasive media.

The manufacturer investigated barrel finishing, found that the burrs could be removed at low cost without disturbing tolerance. He could have his cake and eat it too.

This example demonstrates the progress that barrel finishing has made. It's now a reliable method for controlled stock removal and surface-finish improvement.

The precision now possible in barrel finishing is the result of improved materials, equipment and techniques. Only by using the equipment and materials properly can precision results be attained, however.

We have developed a series of charts and recommendations that show concisely which materials to use, how, and for what.

In setting up a barrel finishing process (assuming that you have already studied your requirements and installed the proper equipment) for a given part, you must consider the following:

1. **Media.** This is the solid material used in the barrels to prevent the parts from impinging or to smooth

By DONALD MOSHER, President

FRANK SOPER, Manager of Sales Engineering

and THOMAS LOLL, Consultant
BMT Manufacturing Corp.
Elmira Heights, N. Y.

Donald Mosher

Frank Soper

Thomas Loll

the surface or remove stock. Various types and sizes are available, each with properties that make it useful for one or more operations.

2. **Compounds.** These are chemicals which are dissolved in the water that is poured in over the parts and media. They keep the media from loading or glazing with the metal being removed, help to lubricate, suspend fine materials, dissolve salts and condition the water, remove scale, clean the parts and media. Three basic types are available: acid, alkaline and neutral.
3. **Loose Abrasives.** These are added to the barrel load of media, parts and compounds to aid in removing metal. Various types and grit sizes are available.
4. **Solution Level.** How much of the compound-plus-water mixture? Above or below the level of parts and media? Variations make a difference in speed and results.
5. **Barrel Speed and Cycle Time.** Rotational speed of the barrel, length of time for processing and barrel size must be varied according to the type of part and the finish desired.

Let's consider each of these factors in detail and see how to scientifically select the materials and methods that will do precision work in the shortest time.

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Media

Almost everything from walnut shells to old shoes has been tried as barrel finishing media. Trial and error and scientific experimentation have narrowed the choice to the materials now used. In choosing from the media available, shape, materials, and size are important.

Shape. Two general types are used: specific shapes and random shapes. Both are useful, but in precision barrel finishing, specific shapes are the most important, for the following reasons:

1. Correct size can be selected to prevent lodging in slots and holes.
2. Specific shapes remove stock faster, thus cutting the time required.
3. Correct shape allows maximum surface contact.
4. Faster cutting action decreases peening and rolling over of burrs.

Materials. Media is either abrasive or non-abrasive. In general the abrasive media are used to remove stock, while non-abrasive media are used to refine surface.

For precision barrel finishing, the most important type of media is an abrasive-type synthetic product called vitrified abrasive (Fig. 1). In simple terms this means that the abrasive has been pressed together by man-made forces into individual masses which are used as media. The reason for the importance of this material is that size and type of abrasive used in manufacture can be selected and size and shape of each

medium can be easily controlled.

The other types of media are also used in precision barrel finishing, but since vitrified abrasive is so important, we will divide this description into two parts: *Vitrified Abrasive Media,* and *Other Types of Media.*

Vitrified Abrasive Media. In selecting vitrified abrasive media, you must consider the following factors in relation to the part you are processing and the job you want to do: shape, size and length, type of abrasive, and grit size.

- *Shape.* Two shapes of abrasive media are available: triangles and cylinders. Each has definite uses. (Fig. 2).
- *Size and Length.* (see Fig. 2 for definition of terms). Larger sizes produce a rougher cut and more violent action. In general, use the largest size that can be used to accomplish the result desired. Size of media that should be used is largely determined by characteristics of the part being processed. Smaller sizes and shorter lengths are required for processing parts that are fragile, soft, or have close tolerances to be held. The size selected must not plug slots and holes in the parts.

The following example shows how to select the proper shape and size of media for a given part:

Assume that the part is a small, fragile, precision stainless steel part with a 1¾ inch hole in the center. You want to deburr the edges of all corners, including the hole.

1. You should choose triangular shape because the hole is square and you want to deburr edges (Fig. 1).
2. To pass through the hole, size and length of the media must

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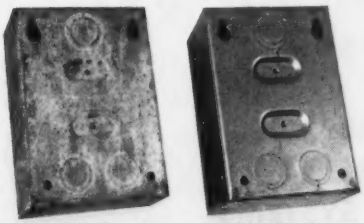

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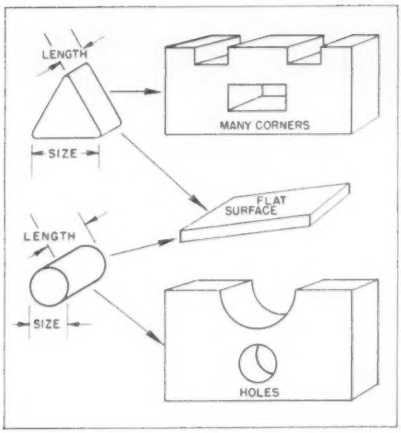

Fig. 2—Two common specific shapes of media are shown at left: triangle and cylinder. The terms "length" and "size" are illustrated. Arrows show typical uses of these shapes: triangle aids in processing parts with many corners; cylinder is useful when parts have holes; both triangles and cylinders are used in processing simple, flat surfaces.

be smaller than 1¾ inches. Closest is 1½ inches. Therefore, a triangle 1½ inches in size and 1½ inches long is the largest you could possibly use.

3. Since the part is fragile, however, you are limited to even smaller sizes so as to avoid damaging the part. Thus even though a larger size and more aggresive cut might be desirable from the standpoint of processing time, you are limited to a triangle ¾ by ⅞ inch.

• *Type of Abrasive.* Specific-shape vitrified-abrasive media is made from straight aluminum oxide, straight silicon carbide, and blends of these two.

Straight aluminum oxide is the hardest and longest wearing. It cuts all metals quickly, wears slowly, withstands long cycles. It is the most commonly used abrasive—a general-purpose material.

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Straight silicon carbide is the softest of the three. It is used on softer metals such as aluminum and copper and for light metals and parts. Wears rapidly when used on heavy parts.

Aluminum oxide - silicon carbide blends have hardnesses between the abrasives just described. They wear faster than straight aluminum oxide, but deburr light, delicate parts more rapidly. Good for use on all light steel, brass, aluminum and copper.

● *Grit Size.* Numbers designate grit size. Larger numbers mean finer abrasives, 240/320 being the finest available. Lower numbers mean that the abrasive is coarser, and thus that cut will be rougher. Figure 3 shows how to select abrasive type and grit.

Other Types of Media. In addition to vitrified-bond abrasive media, specific shapes made from rubber-bonded abrasives and non-abrasive materials are also available. These are used primarily for polishing, although they may be combined with loose abrasives to yield a satisfactory light grinding media.

● *Rubber - Bonded Abrasives.* Used primarily for light deburring and smoothing, removing light rust and scale, and for light polishing. Advantage: media is lightweight, can be used on soft metals such as aluminum and brass, where impingement cannot be tolerated. Only one shape is available, a parallelogram. Sizes, ½ by ½ by ¼ and ½ by 5/16 by ¼ inch.

● *Steel Shapes.* Balls, pins, ovals, and ball-cones are available in many sizes. The variety of shapes (Fig. 4) and sizes available makes it possible to

Abrasive	GRIT SIZE 36/80	46/150	60/120	100/220	100/320	240/320	Properties & Uses
Aluminum Oxide			X	X	X	X	Best cut and life. Most economical. Ferrous & non-ferrous metals.*
Alum. Oxide & Silicon Carbide	X	X					Fast cut, short life. Light and soft materials. Special applications.
Silicon Carbide	X				X	X	Fastest cut, shortest life, light and soft materials. Special applications.
	CUT ← Finer ——— Rougher →						*100/320 grit aluminum oxide is the general-purpose media.

Note: Large "X" indicates grits available.

Fig. 3—Specific-shape abrasive media: types, grit sizes available, properties and uses.

polish hard-to-reach corners, radii, fillets and chamfers. They produce a high polish, or with loose abrasives, a light grinding action.

• *Zinc Shapes.* Use cast zinc balls, stars, and conical shapes (Fig. 5) for light grinding or deburring; for carrying loose abrasives into intricate holes or recesses; to prevent impinging (zinc forms possess a unique shock-absorbing characteristic which prevents impinging); and for burnishing where a high polish is not required.

• *Wood Shapes.* Use wood shapes for polishing plastic parts (Fig. 6).

• *Nylon Shapes.* Use nylon shapes for polishing; especially for polishing plastics.

• *Ceramic Shapes.* Used to supplement zinc shapes. They do not leave a residue.

• *Random Shapes — Abrasive.* Include limestone, granite and aluminum oxide nuggets (Fig. 7). Used for grinding and deburring, and, in certain cases, where polished surfaces are required. Sizes available: aluminum oxide, 1/16 inch to 3/32 inch

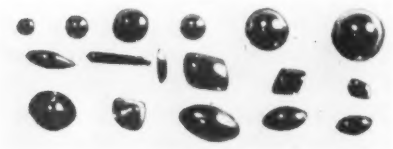

Fig. 4—Non-abrasive media: steel balls and shapes polish hard-to-reach corners.

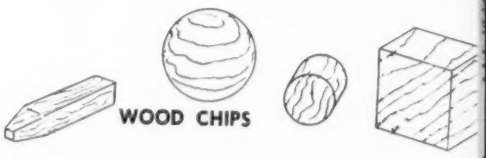

Fig. 6—Non-abrasive media: wood shapes and chips are used in processing plastics.

Fig. 5—Non-abrasive media: zinc stars, balls and other shapes help to prevent impinging.

Fig. 7—Random-shape abrasive media: nuggets are useful in grinding and deburring.

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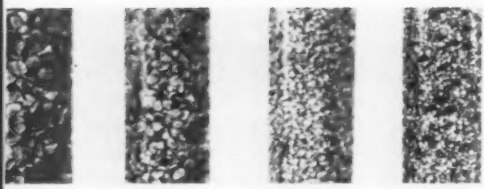

Fig. 8—Non-abrasive media: walnut shells.

for use where precise tolerances must be held and ¼ to 2 inches for rougher work; limestone nuggets, ⅛ inch to 3/16 inch for fine work, 1¼ to 1¾ inches for rougher cut. Granite sizes are the same as for limestone.

● *Random Shapes — Non Abrasive.* Includes steel scraps, zinc random shapes, ceramic shapes, walnut shells and cellulose grit. Used primarily for burnishing. Steel, zinc and ceramic random shapes have the same characteristics as the specific shapes of these same materials, and can likewise be used in polishing. Walnut shells (Fig. 8) are useful for polishing as well as light deburring. Sizes available: 6/10 to 20/30. Cellulose grit, a corn cob product, is useful in polishing as well as for drying parts after wet tumbling operations.

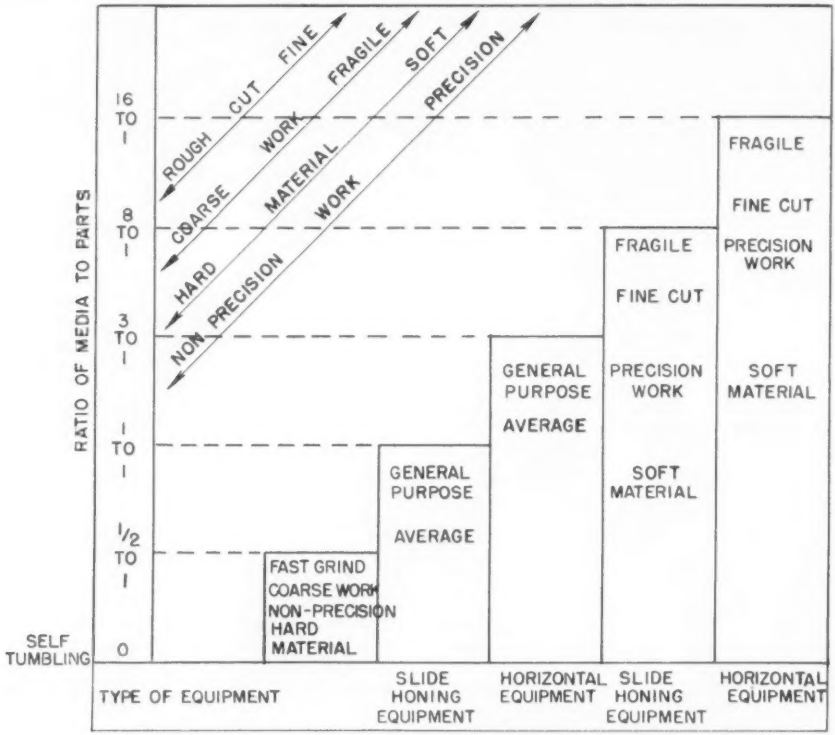

Fig. 9—Chart shows the ratio of media to parts (by weight) that should be used for various types of parts and operations. Higher ratios produce gentler action.

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Ratio of Parts to Media

Having determined the type and size of media to be used in a given barrel finishing operation, you must decide what portion of the load is to be parts and what portion media. Recommendations are given in Fig. 9.

To demonstrate the use of Fig. 9, let's assume we have a part which is fragile, precision and small, has a hole 1¾ inches square in the center.

1. Because the part is fragile, you have to use more media than parts.
2. The ratio must be between 1 to 1 and 8 to 1 (volume of media to parts) on Slide-Honing equipment, or between 3 to 1 and 16 to 1 on horizontal equipment.
3. For experimental purposes, choose a ratio halfway between these limits: 4 to 1 on Slide-Honing equipment, 9 to 1 on horizontal equipment. Then vary this ratio until the optimum point is reached.

The higher the ratio of media to parts, the greater the protection for the parts. Fragile parts require a lot of media to prevent impinging.

—This article to be continued in January PRODUCTS FINISHING. Recommendations will be given on Compounds, Solution Level, Loose Abrasive, Barrel Speed, Cycle Time, and Barrel Size.

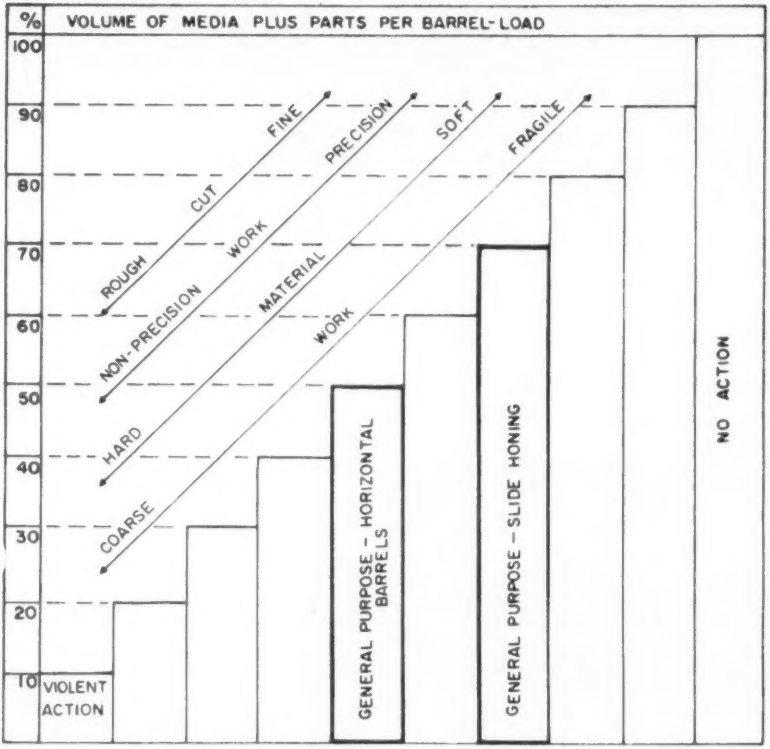

Fig. 10—Tumbling action becomes less violent as combined volume of parts and media increases. (Illustrations courtesy BMT Manufacturing Corporation, Elmira Heights, N. Y.)

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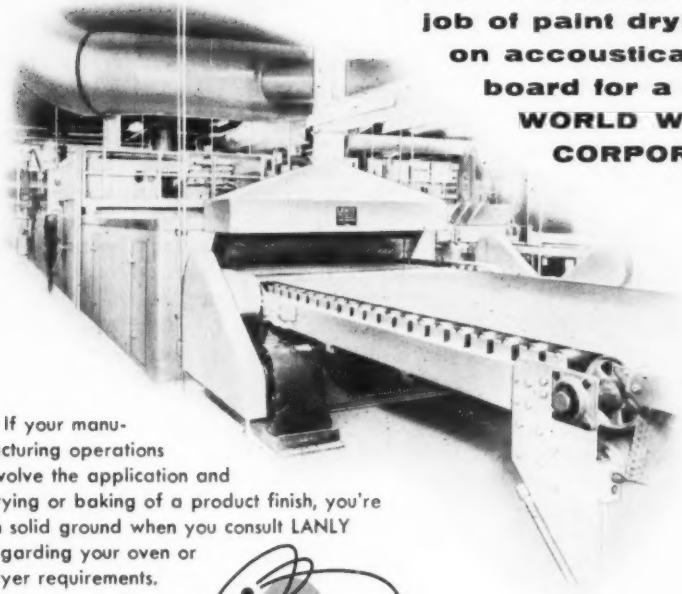

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Coolers and Heaters for Anodizing

How anodizers are using plate-type heat exchangers . . .

By R. S. ROWLAND
Senior Sales Engineer
Tranter Manufacturing, inc.
Lansing, Mich.

and

ALAN KOREST
Korest Company
Grand Rapids, Mich.

and

J. W. PETERSON
Korest-Peterson Company
Detroit, Mich.

Plate-type heat exchangers are doing a good job of heating and cooling solutions for several large anodizers. The prefabricated units cool sulfuric acid anodizing tanks and heat solutions used for cleaning, rinsing, bright dipping, sealing and dyeing.

Plate-type heat exchangers made by Tranter Manufacturing, inc., Niles, Mich., are called "Platecoils." They consist of two embossed sheets of metal, resistance welded to form a series of passages through which heating or cooling media can pass. Being flat, they take little space and are easy to remove for cleaning. Their serpentine design results in good heat-transfer characteristics.

Kawneer Company has installed Platecoils in its Niles, Michigan, anodizing line. The flat heat exchangers supply extra Btu's to cleaning and sealing solutions, cool the anodizing solutions.

In the anodizing tanks (each of which is 26 by 5 by 7 feet deep), Platecoils serve both as heat exchangers and as the cathode surface. Well water runs through them to cool the solution, and by attaching them to the cathode rail, they become part of the electrical circuit for this electrolytic process.

The three anodizing tanks in this line are each 26 by 5 by 7 feet deep, made of plain steel, rubber lined.

The anodizing solutions Kawneer uses for finishing 20- to 25-foot extrusions are 16.5 per cent sulfuric acid with a specific gravity of 1.115 and a specific heat of 0.85. Air agitation keeps the solutions uniform.

Temperature of the solutions is kept at 70 deg. F. by circulating well water through 24 Platecoils (each 22 by 71 inches) in the first two tanks and 18 in the third. Water enters the units at 53 deg. F., leaves at 58 deg. F.

Current supplied to the tanks equipped with 24 units is 9200 am-

peres at 17 volts. Each of these tanks creates heat at the rate of 534,000 Btu./hr. In the tank with 18 units, the electrical input is 7500 amperes at 17 volts. Heat output, 437,000 Btu./hr.

By connecting the Platecoils to the cathode rail they serve as the cathode surface. This eliminates the need for separate cathodes in the tank. Plastic pipes connect the Platecoils to the water supply, electrically insulating the cathode from the water-supply system.

Since well water tends to build up scale on the interior of systems used to carry it, more Platecoils have been installed than would actually be necessary from a theoretical heat-transfer computation. The extra units compensate for the loss in efficiency that occurs as scale builds up.

The Platecoils for this installation are fully annealed Type 316 stainless steel. This seems to hold up well and shows no evidence of corrosion after three years' service. As a matter of fact, there is reason to believe that the cathodic protection that results from making the units a part of the electrical circuit is beneficial.

At any rate, the combination of air

Fig. 1—One of three sulfuric acid anodizing tanks at Kawneer Company, Niles, Mich. Platecoils are not visible, but piping shows their location. Cathode rails provide electrical contact so that Platecoils can be used as the cathode in anodizing. Circulating well water cools solution. (Photograph courtesy Tranter Manufacturing, inc., Lansing, Michigan.)

"If Platecoils are not made part of the electrical circuit . . . they should be insulated from contact with tank walls and pipes."

agitation, operating temperatures of 72 deg. F. and cathodic protection seems to provide a favorable environment for Type 316 stainless. If Platecoils are not made a part of the electrical circuit in an anodizing tank, they should be insulated from contact with the tank walls and pipes. If they are a part of the electrical circuit they should be insulated from all contacts that are not part of the circuit.

Another manufacturer of fabricated aluminum parts has made a similar installation in his anodizing tanks. This system includes two Type 316 stainless steel Platecoils in the anodizing tank. Each is 22 inches wide and 83 inches long. A thermostatic control regulates flow of water through the units to keep temperature at 70-72 deg. F.

Spent cooling water flows into the rinse tanks, where temperature is not critical. This aids the plant's water-conservation program.

Related Uses

Platecoils are used in other tanks besides the anodizing tank. At Kawneer Company, for instance, they are used in cleaning, water rinse, dichromate seal and rack-strip tanks.

Tranter Manufacturing recommends the following types of Platecoils for such applications:

- Cleaning, water rinse, dichromate seal and rack-strip tanks should be equipped with mild steel Platecoils.
- Bright dip tanks and rinse tanks immediately following bright dips should be equipped with fully annealed Type 316 stainless Platecoils. Type 321 or 347 is sometimes used where annealing is not possible.
- Water-seal, dye and dye-seal tanks should have Type 316 fully annealed stainless Platecoils.

These recommendations are generally adequate, but specific selection of materials should take into account all factors present in a given installation. Agitation, operating temperatures and exhaust systems all may affect the choice of material.

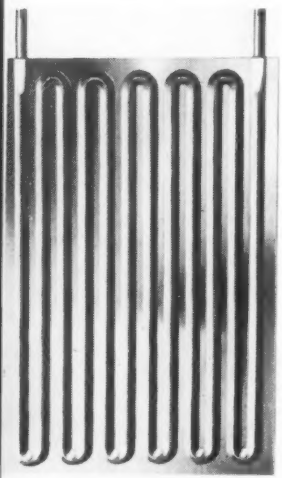

Fig. 2 — Style 60 Platecoils made as shown are installed in anodizing tanks. By circulating water through the serpentine passages, temperature of anodizing solution is kept down to 70-72 deg. F.

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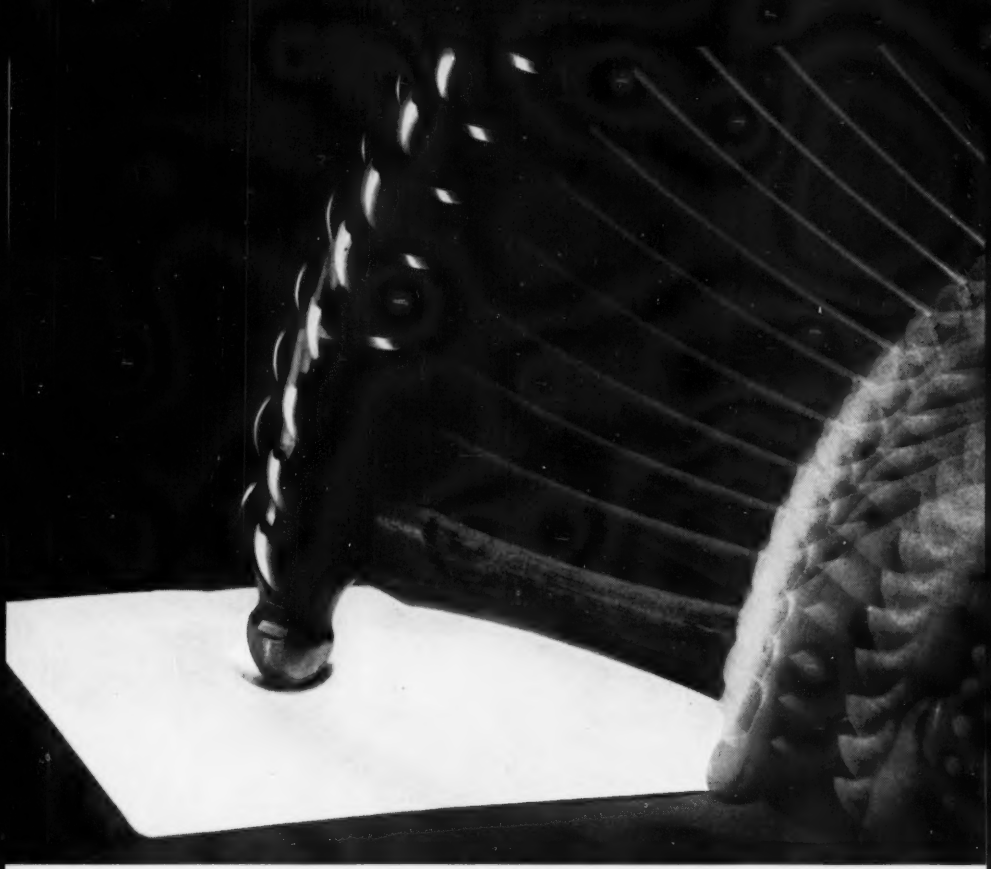
See details on page 134



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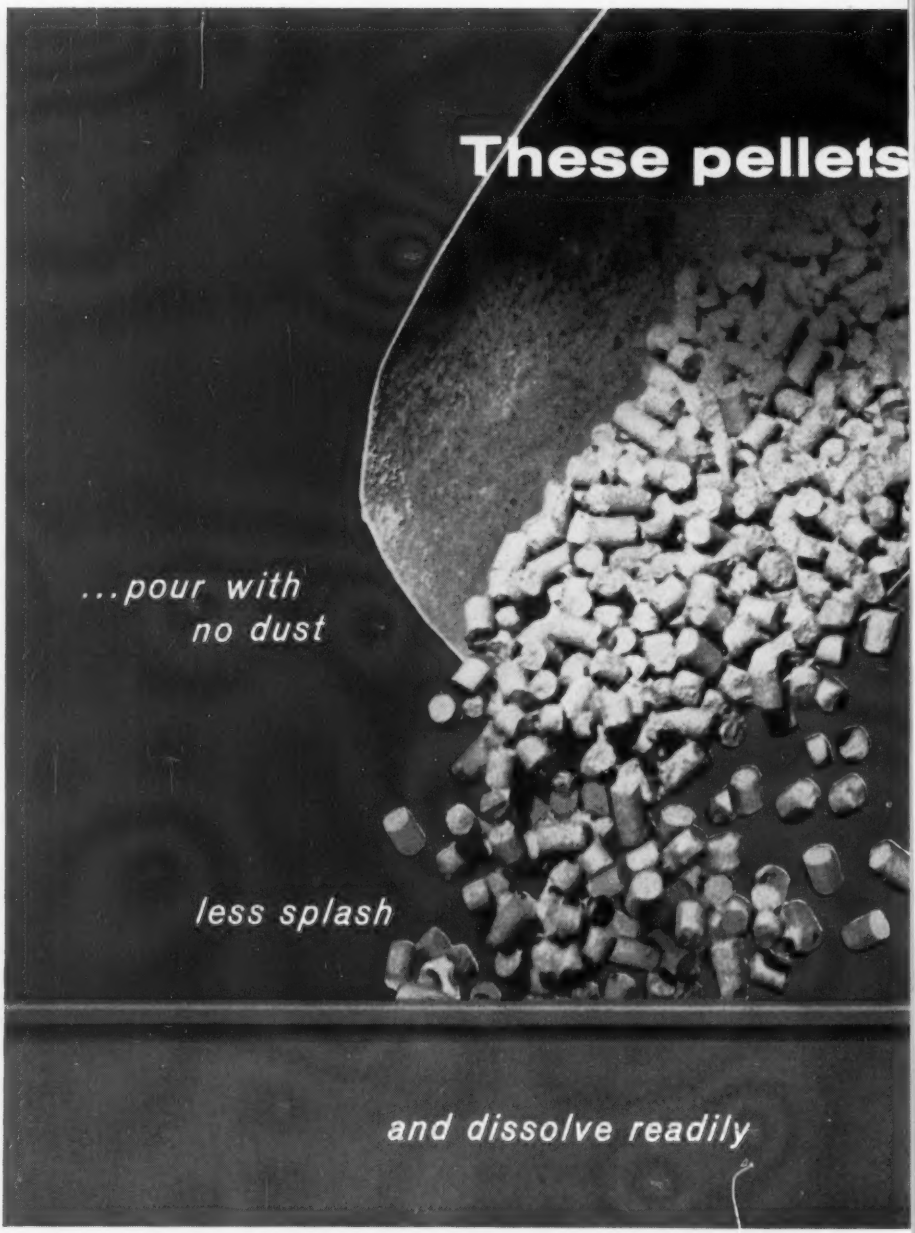
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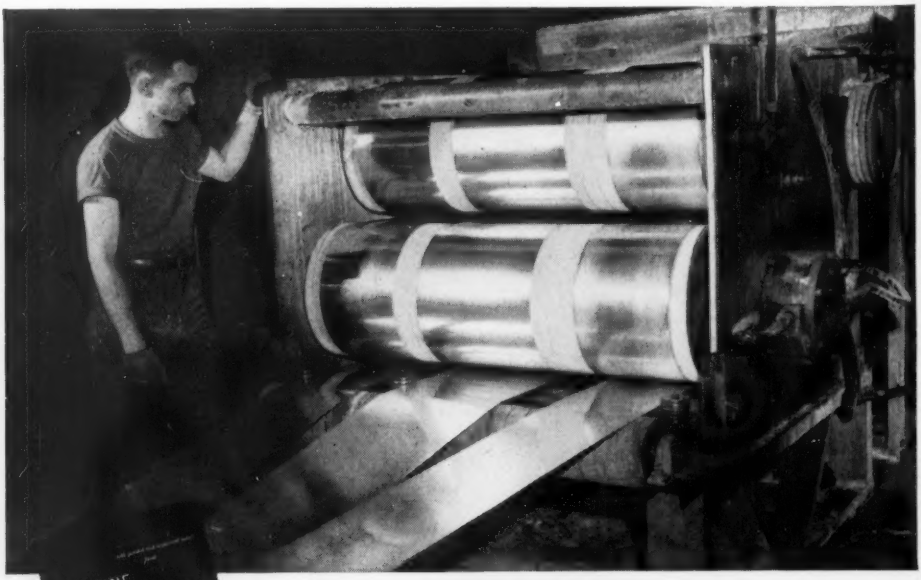

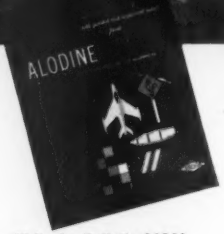

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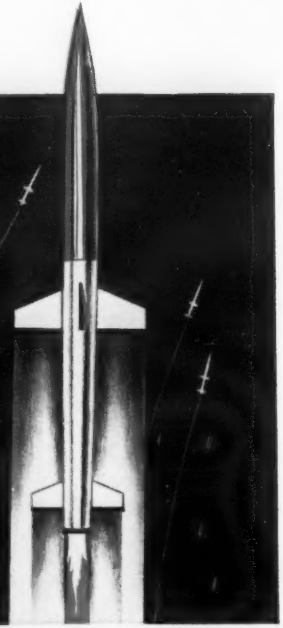

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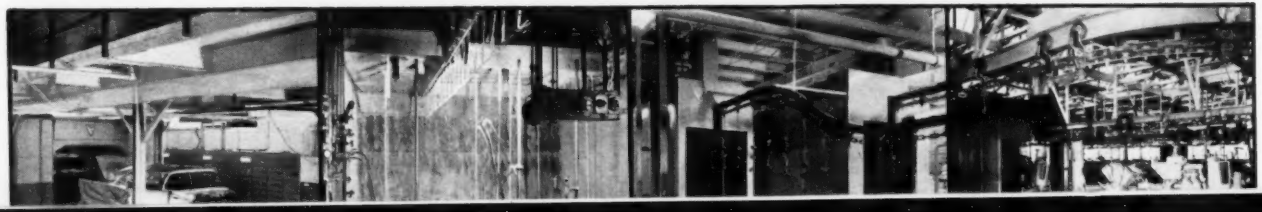

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Finishing-Industry Interviews

Exhibitors at National Metal Congress comment on how finishers can get maximum efficiency from their products . . . what common mistakes finishers make . . .

Reported by **EZRA A. BLOUNT, Editor**

Robert A. Peoples: Keep Conveyor Hangers Clean

Mr. Peoples, sales engineer, Ransburg Electro-Coating Corp., Indianapolis 23, Indiana, states: "Conveyor hangers in electrostatic painting installations must be kept clean so that the conveyor is grounded at all times. Indexing hooks should be kept free from paint also. Hangers themselves should be kept loaded. If the hangers are not loaded, they will be covered with paint on the contact points; then parts loaded on the paint-covered hangers do not make electrical contact, and are not covered properly during the electrostatic painting process. Provisions for automatic stripping of paint from conveyor hangers, once in each cycle, are strongly recommended."

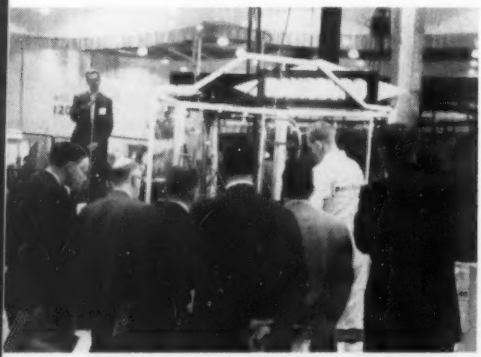

Fig. 1—Robert A. Peoples (left, rear) describes Ransburg electrostatic hand gun painting as operator applies a metallic paint to a tubular product (foreground).

Fig. 2—L. E. Kanouse (at right, facing camera) explains that surface temperatures of products being baked in infrared ovens can be controlled closely by cyclic timer controls.

L. E. Kanouse: Determine Correct Drying and Baking Equipment by Field Tests Conducted In Your Plant

Mr. Kanouse, vice president and sales manager, Dry Clime Lamp Corp., Greensburg, Indiana, comments: "It is just as important for us to prove to the customer that our products will *not* do the job, as it is for us to show him that they *will* perform the required task. Field tests conducted in his plant will keep him from making mistakes in specifying equipment.

"After he has purchased our infrared equipment, he should carry out proper maintenance to secure the maximum equipment life. Only minimum maintenance is required."

William P. Nunn: Do Not Change Barrel Finishing Process or Materials Without Thorough Performance Tests

Mr. Nunn, Honite field engineer, Minnesota Mining & Mfg. Co., St. Paul 6, Minnesota, further advises: "When you set up a barrel finishing department, seek the advice of a company with a reliable field engineering service. In this way, you will be sure to get the proper equipment and materials designed to perform the functions specified. Be sure that the equipment ordered is actually needed. Any responsible company will gladly make a survey of your production needs to be sure that you can use barrel finishing equipment effectively. When your equipment has been installed and is operating properly, do not make changes in materials without careful study. Small savings on substitute materials are insignificant, since they may result in serious and expensive process difficulties."

A. Ward Stoddard: Use Properly Designed Degreaser and High Grade Solvent for Best Results

Mr. Stoddard, director of public relations and advertising, Detrex Chemical Industries, Inc., Detroit 32, Michigan, further states: "Ex-

Fig. 3—Feature of Minnesota Mining exhibit was synthetic chip for tumbling zinc base die castings which does not impinge surface, produces a "buffed" finish.

Fig. 4—Detrex exhibit featured displays of cleaning, degreasing, and ultrasonic degreasing equipment. Special exhibit was a vapor generator for cleaning tank trucks.

cessive solvent losses frequently result from the use of improperly designed degreasing equipment. Also, improper maintenance and infrequent inspections are causes of unsatisfactory degreaser operation.

"Train your operators to perform regular inspections and use recognized maintenance procedures. Be sure that your supplier is furnishing you with the grade of degreasing solvent that you have specified."

D. L. Bohon: Proper Use of a Hose and Equipment Cleaner is Essential

Mr. Bohon, assistant manager of industrial sales, The DeVilbiss Company, Toledo 1, Ohio, advises: "Equipment used in spray-applying finishing materials at elevated temperatures must be kept clean to assure satisfactory service. At the end of each shift, or work period, it is essential that the spray gun, heater, pump and hose line be cleaned thoroughly. To clean the system, select the proper solvent, specific for the finishing material being used; place solvent in 1-quart container; connect fluid hose (disconnected from spray gun) and air hose to container. Adjust air pressure so that air and solvent will flow through system with "scrubbing action." One quart will clean 50 feet of hose and a pressure tank. Larger units are available for multiple spray systems."

Fig. 5—D. L. Bohon discusses various features of new DeVilbiss unit for spraying catalyzed resin coatings, urethane foam coatings for corrosion protection and insulation. DeVilbiss display included 50 different spray guns.

Fig. 6—Dr. Norman A. Flannigan (right), advertising manager, Consolidated Vacuum Corp., Rochester, New York, joins a group of visitors to CVC mechanical vacuum pump exhibit. Dr. Flannigan emphasized that this mechanical vacuum pump, Type DK 90, designed for large vacuum metallizing units, operates quietly and free from vibration. (Photographs by PRODUCTS FINISHING.)

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Help Fight TB

Use Christmas Seals

What's glue got to do with the price of finishing?

Stuck? Then you'll be interested to learn that glue is but one of several bonds used to hold the cutting grains to the backing in the manufacture of coated abrasives. Varnishes and resins are also common bonding materials. The problem is to select the proper bonding material to assure maximum belt life. Jewel Brand Abrasive Engineers know, for example, that glue is commonly recommended for dry, low heat applications while resins are usually required where toughness and resistance to water, heat and high working pressures are in demand. Their ability to recommend the proper bonding material often results in substantial savings in time, labor and materials. It will pay you to put their knowledge to work for you. Write for complete details. Abrasive Products, Inc., 509 Pearl Street, South Braintree, Mass.

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rolls
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specialties

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COATED ABRASIVES

ABRASIVE PRODUCTS, INC., South Braintree 85, Massachusetts

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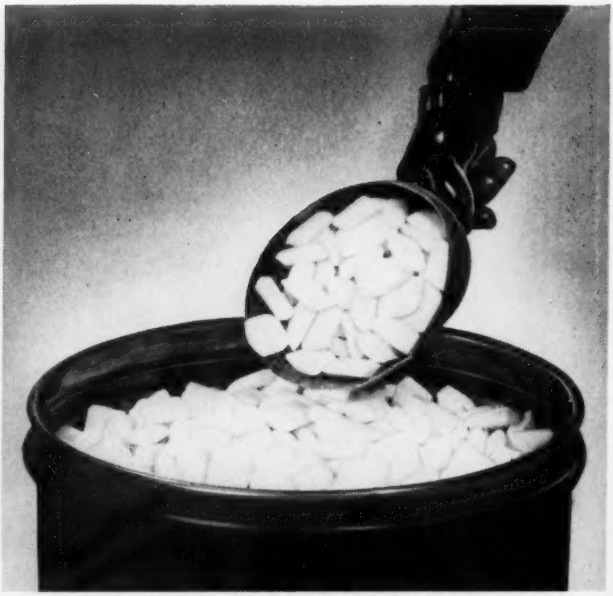
ALL-PURPOSE "CYANOBRIK" is shipped in full-open-head drums and is made in the form of 1-ounce pillow-shaped briquettes, convenient for measuring small quantities. Dusting is minimized, and accidental spillage can be cleaned up quickly and safely. It can be used in all sodium cyanide applications...including case hardening.



This is all-purpose "Cyanobrik" sodium cyanide.

Du Pont announces...

All-purpose Cyanobrik® —two convenient forms

All-purpose "Cyanobrik" in briquette form can be used in all sodium cyanide applications—including case hardening

JUST A TWIST OF A WRENCH unlocks the full-open-head drums used to ship all-purpose "Cyanobrik" and new "Cyanogran" M. Drums can be easily reclosed to provide full protection for unused contents.

Now you can use all-purpose "Cyanobrik" efficiently in *all* known applications for sodium cyanide, including plating, case hardening and chemical manufacture. The reason—a new manufacturing process at Du Pont's modern Memphis, Tenn., plant has succeeded in making "Cyanobrik" lower in moisture content and more resistant to moisture than ever before.

All-purpose "Cyanobrik" is guaranteed 97% minimum sodium cyanide. Maximum impurities are held so low you get an *extra pound* of active cyanide in every 100 lbs. you buy. And because it can be used in *all* applications, all-purpose "Cyanobrik" can help *you hold inventories down, simplify your purchasing*. Look at these high-quality specifications:

NaCN—97% min.; NaCl—0.2% max.; Sulfides as S—0.0005% max.

For more information just give your local Du Pont Distributor

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This is "Cyanogran" M sodium cyanide.

EASY-TO-DISSOLVE "CYANOGRAN" M has the same high purity of all-purpose "Cyanobrik"—97% minimum sodium cyanide. It passes through a 10 mesh screen, but not a 50 mesh screen . . . is easy to handle because fines and dusting are eliminated. "Cyanogran" M is also shipped in full-open-head drums.

and new Cyanogran® M of sodium cyanide 97%

New "Cyanogran" M, a granular easy-to-dissolve form of all-purpose "Cyanobrik" sodium cyanide—at no extra cost!

"Cyanogran" M was developed by Du Pont specifically for dry compounders who require a uniform particle size and for those who desire sodium cyanide in a more rapidly soluble form. It is controlled in size during manufacture so that it will pass 100% through a 10 mesh screen and will be retained by a 50 mesh screen. Result: "Cyanogran" M is easy to handle due to absence of fines and dusting.

"Cyanogran" M and all-purpose "Cyanobrik" are sold at the same low price. Both are made at Du Pont's modern Memphis, Tenn., plant—a reliable domestic source of supply for you. Du Pont and its conveniently located distributors assure you prompt delivery. Here are the specifications for "Cyanogran" M:

NaCN—97% min.; NaCl—0.2% max.; Sulfides as S—0.0005% max.

a call, or write your nearest Du Pont District Office listed below.

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Du Pont's experts are always ready to provide on-the-spot service. They're backed by the facilities of Du Pont's new 2-million-dollar sales-service laboratory to help solve *your* problem.

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Los Angeles . . . . . Box 70, El Monte, Calif.
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. . . THROUGH CHEMISTRY

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SPOTLIGHTING

Finishing Progress

Surface Treatment of Titanium

By DR. NELSON F. MURPHY

Since titanium is becoming more plentiful and is being used more and more in industrial equipment, finishers can expect more frequent orders for surface treatment and coating of titanium parts. Several recent publications have described the surface treatment of titanium.[1]

Anyone who finishes titanium should first study the physical and chemical properties of this comparatively new metal on the engineering scene.

One of the most important properties is the tendency this metal has to form an oxide film on the surface. The oxide film that forms on titanium is similar to the oxide film that forms on aluminum. The film is not insulating, however, and dielectric breakdown voltage is nil. It is porous, will retain lubricants. Colors vary from yellow to violet, depending upon the thickness.

[1]H. Richaud, *Metal Finishing Journal*, January, 1957, page 10.

Pickling

To remove the oxide film from titanium, several pickling solutions have been proposed.[2]

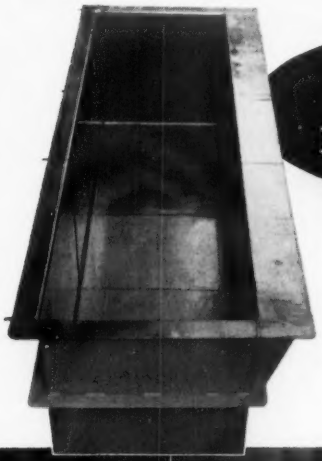
Dr. Nelson F. Murphy
Research Professor of Chemical Engineering, Virginia Polytechnic Institute

In the Virgo process a molten mixture of 96 per cent sodium carbonate and four per cent sodium nitrate is prepared and used at 932 deg. F. This molten bath dissolves the oxide but leaves the metal unaffected.

Acid baths have been used for pickling. A solution of 15 per cent by volume of hydrochloric acid (22 degrees Baume) and three to five per cent by volume of 40 per cent hydrofluoric acid in water is used at room temperature. This mixture is very active and attacks the metal as well as the oxide film. If the treatment is not carefully controlled, an

[2]See also "New Way to Descale Titanium" PRODUCTS FINISHING, October, 1958, pages 42-44.

A TANK LINING FOR EVERY SOLUTION



Amer-Plate®
PVC TANK LINING

Whether your plating and processing tanks are steel, concrete or wood, Amer-Plate can protect them indefinitely against corrosive solutions. Amer-Plate is a dense thermoplastic sheet made from high polymer vinyl chloride resins molded under high pressure and temperature.

- **It is unaffected by strong acids and oxidizing materials.**
- **It is non-toxic in food and beverage service.**
- **It is impervious to diesel oil, sour crude, aliphatic petroleum hydrocarbons.**
- **It will withstand hard chrome liquor to 160°F.**
- **It is resistant to highly corrosive salts.**
- **It resists alkalis including 50% caustic soda.**
- **It is insoluble in aliphatic alcohols, glycol and glycerine.**

Amer-Plate adheres not only to steel but also to concrete or wood without costly metal interlining. It is ideal as a membrane under acidproof brick construction. Amer-Plate is also supplied with a T-ribbed back for casting into place in new concrete tanks. Applicators are strategically located throughout the U.S. and Canada.

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etch pattern will form on the surface. The treatment leaves a gray, matte finish.

A solution of 20 per cent by volume of nitric acid (40 degrees Baume) and one to three per cent by volume of 40 per cent hydrofluoric acid will be less active than the hydrochloric acid pickle. This is also used at room temperature and gives a smooth, light gray surface.

The General Electric Company immerses titanium articles in an aqueous solution of sulfuric acid and calcium fluoride to convert scale to a gray film.[3] The gray film is removed in a solution of mineral acid. For treating titanium prior to chromium plating Missel immerses pieces of titanium in a bath of 0.5 to 2.0 per cent by weight hydrofluoric acid, saturated with chromic acid.[4] The bath is heated to 180 deg. F. Parts are immersed for 10 to 20 minutes. This bath is especially useful for alloys of titanium containing manganese, aluminum, vanadium and/or chromium. In some cases the adherence of sub-

[3]G. F. Albers and W. B. Stephenson, U. S. Patent 2,827,402, March 18, 1958.

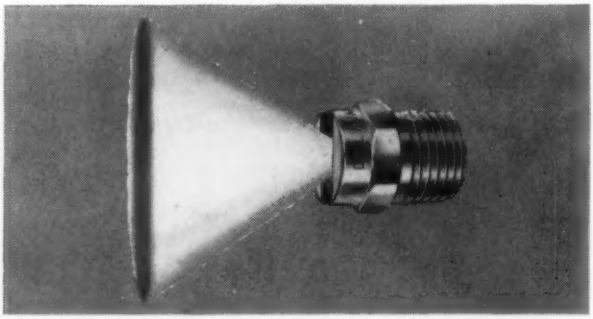
[4]*Proceedings American Electroplaters' Society*, 1956; U. S. Patent 2,829,091, April 1, 1958.

PROBLEM:

Metal cleaning — find a nozzle that cleans and rinses metal for further finishing

SOLUTION:

Delavan Type WF nozzle



This efficient nozzle delivers a flat, hard-hitting, uniformly distributed spray pattern. Its exclusive orifice design and tapered inlet assures maximum resistance to corrosion and clogging. WF nozzles are furnished with a hex-shaped body that permits easy installation and removal with standard socket wrenches. A wide selection of capacities, spray angles, pipe sizes and materials is available.

If the right nozzle will improve your metal cleaning operation, there's a Delavan nozzle that will do it better. Write for Catalog 33A today.

DELAVAN Manufacturing Company

WORLD'S LARGEST MANUFACTURER OF NOZZLES • WEST DES MOINES • IOWA

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for defect-free

die-cast plate . . .

Use Kelite **SUPERSOLV*** *as the Soak Cleaner prior to electrocleaning*

- *What* **SUPERSOLV** *is . . .*

SUPERSOLV is a non-etch, non-passivating alkaline soak cleaner for zinc-base die-cast parts.

- *What* **SUPERSOLV** *does . . .*

Used at a concentration of 5 oz./gal. at 160° to 170° F., SUPERSOLV removes mineral oils, buffing compositions and shop soils in a 1 to 2-minute soak cycle without sensitizing or staining the parts, or making them subject to roughness after electrocleaning and acid dip. The result is defect-free plate of improved brightness and lustre.

A Typical Zinc-Base Die-Cast Cleaning Cycle Using SUPERSOLV

Stage	Operation	Material	Concentration	Temperature	Time
1	Emulsion soak	Kelite Ke-Sonic-C®	1 to 500 Water	200° F.	5 min.
2	Spray rinse	Water	.....	140°F.	2 min.
3	Alkaline soak	Kelite Supersolv	5 oz./gal.	165° F.	2 min.
4	Spray clean	Kelite MD-1-S	¼ oz./gal.	140°F.	1 min.
5	Anodic alkali clean**	Kelite No. 41	5 oz./gal.	160° F.	2 min.
6	Rinse	Water	.....	Ambient	1 min.
7	Acid dip	Kelite Process Z	2 oz./gal.	Ambient	30 sec.
8 & 9	Rinse	Water	.....	Ambient	1 min.

* Patented, U.S. Patent Office ** 6 to 7 volts, 15 - 25 ASF

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Finishing Room Superintendents Specify the Churchill 20-RD Cord Sisal Finger-Buff* . . .

because they know only the Churchill 20-RD produces a uniform high quality of finish . . .

PLUS

FASTER CUTTING action!
LONGER WEARING qualities!
REMARKABLY smoother finish!
UNEQUALLED FLEXIBILITY in a sisal buff!

Churchill 20-RD Cord Sisal Finger-Buffs* produce exceptional results on stainless. They are competitively priced and made in all sizes from 3" to 21" diameters.

Write for complete information.

**The trade's attention is called to United States Patent No. 2,724,937, issued Nov. 29, 1955, to George R. Churchill relating to the cloth-covered cord sisal buffing wheel exclusively manufactured by Geo. R. Churchill Co., Inc. of Hingham, Mass. and marketed under its trade-mark, "Finger-Buffs", Reg. U. S. Pat. Off.*

REPRESENTATIVES IN PRINCIPAL CITIES

Geo. R. Churchill Co., Inc.

DEPT. PF-129, HINGHAM, MASS.

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sequently plated coatings was improved by rinsing in distilled water.

Mechanical Treatment

Huddle and Flint claim to improve adherence of electroplates to titanium by first shot blasting the surface preferably with a ferrous metal shot, then coating with copper solution.[5] The shot blasting is said to passivate the surface as well as remove the hydrous oxide.

Anodizing

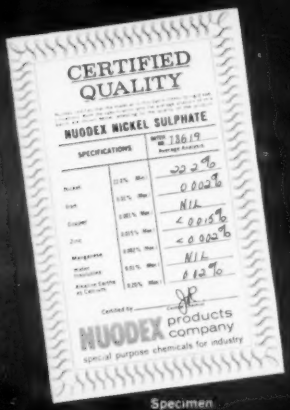
Formation of a uniform adherent oxide film on titanium will improve corrosion resistance and form a base for lubricants and electrodeposited coatings. After cleaning and pickling, the metal may be anodized in a bath of sulfuric acid (22 per cent by weight of 66 degrees Baume H_2SO_4) at 68 deg. F. Anodize at 18 volts. The film formed varies from yellow to violet, the latter requiring about 10 minutes of electrolysis. Anodizing is continued for 20 to 30 minutes if the film is meant for holding lubricants.

If anodizing is to be used as a pretreatment for plating, the piece of titanium is anodized in a solution containing 200 ml. of 40 per cent hydrofluoric acid; 100 grams of zinc fluoride; and 800 ml. ethylene glycol. The treatment is continued for 20 to 25 minutes at 68-77 deg. F., 18 volts, and 50 a.s.f.

Anodizing titanium has been tried in other baths. Bohn studied use of solutions of sulfuric acid, potassium hydroxide and of borax.[6] Coatings obtained in these solutions gave excellent resistance to corrosion in sulfuric acid but no resistance to hydrofluoric acid.

[5]Huddle and Flint, British Patent 788,721, January 8, 1958.

The most important benefit in plating today



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Page 94

New Equipment, Materials, Processes

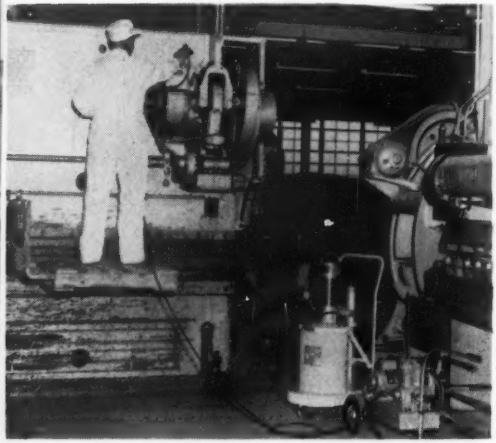
Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metallizing, Chromate Coating, Paint Finishing, Waste Treatment

Airless Spray Equipment

Airless spraying equipment has been developed by Binks Manufacturing Company.

Maintenance painting is handled easily with an airless spray system, since little overspray is produced. Most maintenance painting can be done without shutting down production lines or closing the building.

Binks offers two basic systems: a 55-gallon unit, and a 5- to 10-gallon outfit. With either system, paint is delivered from the original container by the Pacer 300 high-pressure pump. The pump produces pressures up to 3,000 p.s.i., will supply enough material for two spray guns.



Binks Airless Spray: maintenance painting can be done without closing production lines

Binks' airless system comes equipped with a nylon pressure fluid hose with re-usable hose fittings, or it may be ordered with stainless steel hose.

Each system comes with pump, agitator, elevator, fluid manifold, strainer and spray gun.

Model 39 spray gun is especially designed for use with airless systems. A heavy-production gun, it has a tungsten carbide tip for long wear.

The 55-gallon unit fits directly on a 55-gallon material drum. The 5-10 gallon unit fits on a 10-gallon container into which a 5-gallon container may be placed. In either system, the material containers are not pressurized.

Both systems may be operated from plant compressed air systems, or air from one of several Binks' portable compressors. Minimum and maximum operating air pressures (input to pump) are 35 and 110 p.s.i.

Manufacturer: Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago, Illinois.

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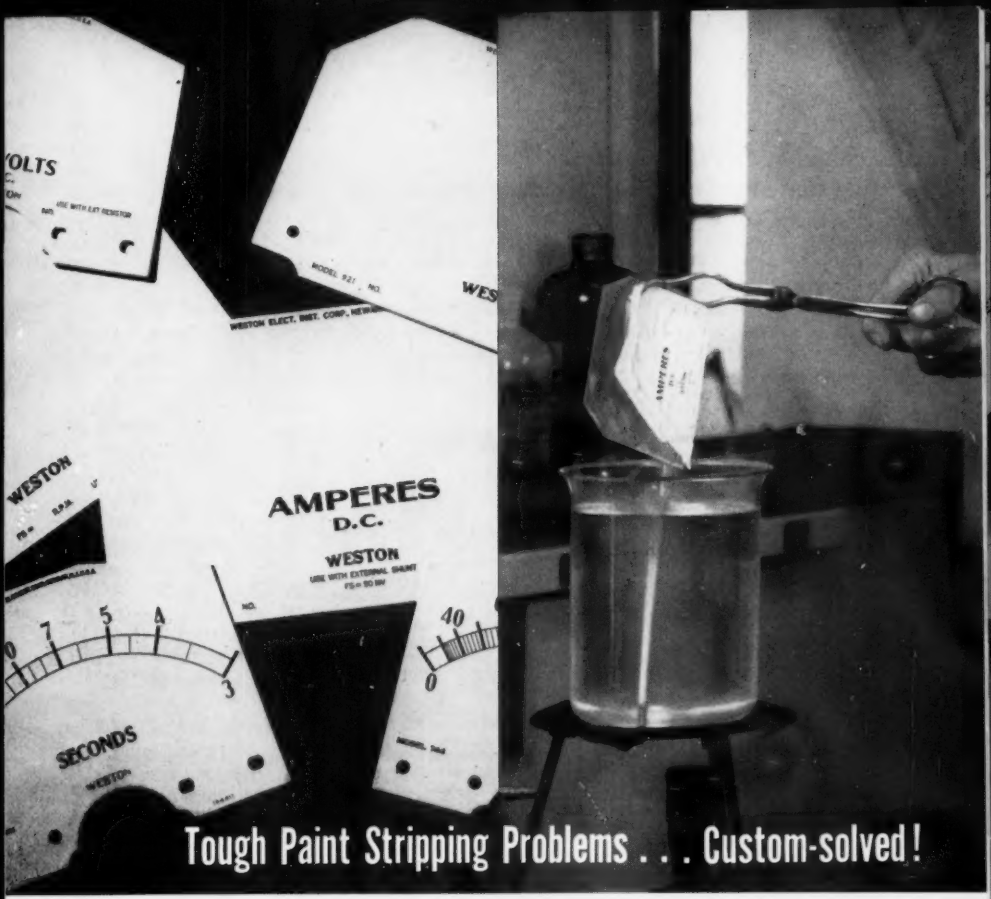

Problem: To remove two coats of specially formulated non-yellowing white baked synthetic enamel, printing, and clear baked enamel top-coat from these Weston Scale plates.

Enthone Stripper Q-561 (specifically developed for Weston Instrument Division of Daystrom, Inc.) breaks the bond between the coatings and the brass or nickel plated brass basis metal.

The many factors that affect paint stripping—type of paint, condition of the metal surface, presence or absence of conversion coatings, method of paint application, baking cycle—make every stripping job unique in itself. In most cases, only laboratory tests on your parts or test panels, and proper evaluation of all the factors involved, can produce the most economical and efficient stripper for your application. Only Enthonics can do this custom research and development job in depth. Write for brochure describing our paint stripping laboratory service. Enthone, Incorporated, 442 Elm Street, New Haven, Connecticut.

ASARCO

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Trichlorethylene-Based Phosphate Coating

A phosphatizing process recently developed by the Electrochemicals Department of Du Pont utilizes a phosphatizing solution in which Du Pont's Triclene trichlorethylene is the solvent. No water is used in the system.

The solvent-based phosphate coating is the third link in a complete system of cleaning, phosphatizing and painting metals in trichlorethylene-based solutions. Trichlorethylene is a commonly used vapor degreasing solvent.

In the process, metal parts get a phosphate coating by dipping or spraying with the trichlorethylene-based phosphatizing solution maintained at its boiling point (188 deg. F.). As the parts leave the hot phosphatizing solution, the volatile solvent evaporates and the part is immediately ready for painting.

The coating as formed on steel is a strongly adherent iron phosphate coating. Weights from 40 to over 200 milligrams per square foot can be achieved in one-half to three minutes' time.

Phosphatizing of other metals, such as aluminum, magnesium and zinc, is also feasible.

In a complete cleaning, metal-preparation and painting system, the user degreases the metal part in trichlorethylene, phosphatizes in the trichlorethylene-based phosphatizing solution, then paints in a trichlorethylene-based paint. All three processes can be incorporated in a single finishing system.

(continued)

A typical experience in the work-a-day lives of thousands of industries.
DOGGONE IT, PETE, THIS HAS GOT TO STOP!
PLANT MANAGER
Just came from heat-treat . . . Not a man wearing a respirator
I'm not surprised, Jim. The men would rather breathe dust than wear heavy old respirators.
I know it. But I'm supposed to enforce safety rules. Oh, for a light, comfortable dust mask!
Here's what you want, men—The Flex-A-Foam Dust Mask—light as a feather!
It's sure light and comfortable, but can it do a man-size job?
It should. It filters non-toxic dust particles 100 times smaller than you can actually see.
Seen Purchasing yet? They're up on new developments.
PURCHASING AGENT
Order a trial dozen, Bob. Maybe they'll wear these without continual prodding.
They're glad to wear Flex-A-Foam Dust Masks. Our troubles are over!
LATER
You're right! We should now equip the entire plant!
(quantity prices as low as $1.10)
Send Today
$1.45
(Industrial price only)
Try low-cost FLEX-A-FOAM and judge proof by performance.
FLEXO PRODUCTS, INC.
Westlake, Ohio

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ANOTHER REPORT FROM THE ALMCO ALBUM OF NEW PRODUCTS

To know what's new in Barrel Finishing

Keep Your Eye on ALMCO!

The right machine, the right method, the right media—that's the basis for any ALMCO *Supersheen* System. A continuing program of research—that's the secret of ALMCO progress in making metal finishing easier, faster, finer. Here are typical recent developments.

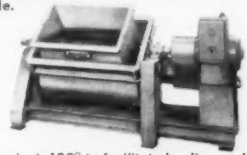
New Spindle Machine

For precise finishing of complex high-quality components on a continuous production line basis. Large parts or clusters of smaller parts are chucked directly to spindles from single operator's work station. Rotating spindles lower parts into high velocity stream of abrasive media contained in rotating tub. All surfaces get same amount of precision finishing in 1 to 9 min. trip around the tub.

Models available with automatic or manual indexing

New ALMCO VIBRASHEEN

New *Vibrasheen* method is particularly suited for faster burr removal and finishing hard-to-reach internal crevices. Vibrates a 5 cu. ft. load . . . uses scrubbing action to do the job in fraction of time needed in ordinary operations. Smaller and larger models also available.



Container pivots 120° to facilitate loading and unloading

ALMCO *has the right New* BARREL FINISHING EQUIPMENT *for you!*

New ALMCO Roll Barrels

One man operates entire Roll Barrel System. Makes low-cost barrel finish available to any deburring and finishing department!

New ALMCO Super Mite

Small in size, big in performance . . . that's the new ALMCO *Super Mite!* Ideal for labs, job shops, research departments and manufacturers with limited finishing needs. Handles close tolerance jobs and low micro-inch finishes; speedily does all deburring and finishing work. It's the new answer to low-cost, small-lot barrel finishing!

ALMCO

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ALMCO ALBUM OF NEW PRODUCTS

For full story on the right machine, right method and right media, write for your FREE copy today!

YOUR SAMPLE PARTS PROCESSED without any obligation! Simply write on letterhead for address of nearest ALMCO lab or send parts direct to Albert Lea, Minn. Enclose specifications desired.

Designers and Builders of All Types of Barrel Finishing Systems for the Metal Working Industry

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Evaporated solvent is condensed and recovered for reuse.

G. S. Blakeslee & Co., Chicago manufacturer of degreasers, cooperated in developing equipment for the process.

The process will be commercially available in mid-1960, Du Pont reports.

Developer: Electrochemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.

For more data circle **2** on Reader Service Card

Black Oxide Finish

"Activated" Black Magic, a blackening solution for steel recently introduced by Mitchell-Bradford Chemical Co., is said to have several advantages over the company's previous blackening solutions.

Advantages of the solution, according to the manufacturer, are as follows: reduced processing time; lowered salt consumption; free rinsing; less drag-out; cleaner, blacker finish; blackens many hardened and passive steels that heretofore were finishing problems; improved corrosion resistance; improved self-rectification, which makes it possible for the solution to tolerate approximately 50 times more contamination than previous self-rectified solutions.

Any contaminants introduced into the solution react with the solution and are forced to the top. They can then be skimmed off to keep the solution clean and free of contaminants.

Activated Black Magic is a one-bath process, requiring addition of only one chemically balanced salt for make-up.

The finish produced meets all government and commercial speci-

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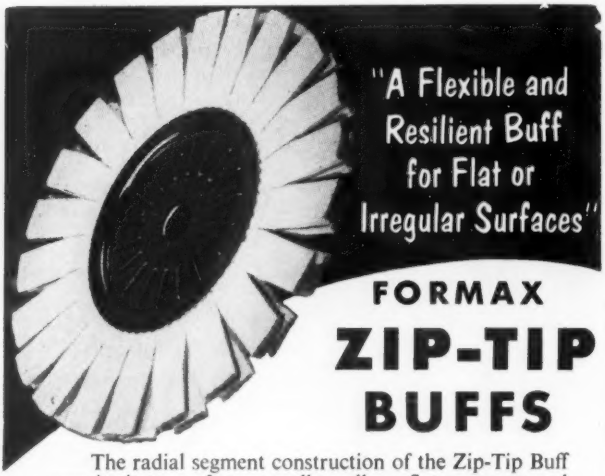

FORMAX
ZIP-TIP
BUFFS

The radial segment construction of the Zip-Tip Buff permits it to perform equally well on flat or contoured surfaces. The cross-cutting movement of the spoke-shaped segments prevent work streaking while it breaks up straight-line patterns on the surface.

- **Zip-Tips are available in a wide variety of all cloth constructions —also combinations of cloth and sisal.**
- **Zip-Tips are made of heavy-duty, bias-cut materials mounted on ventilated steel centers.**
- **Zip-Tips are extra thick and provide wider buff faces with greater compound retention capacity.**
- **Zip-Tips are perfectly balanced —require no raking.**

Write for Descriptive Literature

FORMAX MFG. CORP.
DETROIT 7, MICHIGAN
"THE FOUR McALEERS"

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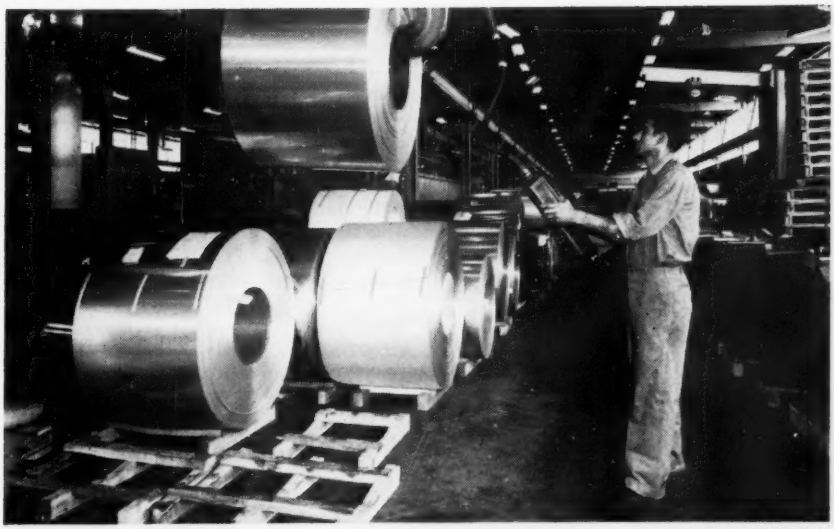


Photo courtesy LITHO-STRIP CORP.

NOW-Your Product, too, can have the extra values of BONDERITE for Aluminum!

SPECIFY BONDERIZED AND PAINTED ALUMINUM STRIP

Get the jump on your competitors by offering the well-known extra values of Bonderite for aluminum on your products.

If your production justifies it, install a Bonderite line; if you don't want to make the investment right now, specify BONDERIZED and painted stock from your supplier.

Bonderite on aluminum adds tremendously to the appearance and performance life of the paint finish. Paint is anchored so securely that stamped and roll formed products may be fabricated without chipping or peeling of the paint film or any loss of adhesion, even after most severe deformation.

To meet and beat competition, equip your products with recognized Bonderite sales appeals:

1. Longer-lasting fine appearance.
2. Positive corrosion control.
3. Increased paint durability.

More than 200 plants, of all sizes, are using Bonderite for aluminum today. Investigate for *your* plant now!

Bonderite for aluminum meets and exceeds the requirements of Government Specification MIL-C-5541.

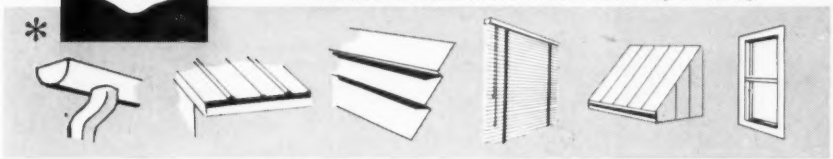
Since 1914— leader in the field

PARKER RUST PROOF COMPANY

2172 E. MILWAUKEE • DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base. BONDERITE and BONDERLUBE aids in cold forming of metals. PARCO COMPOUND rust resistant. PARCO LUBRITE—wear resistant for friction surfaces. TROPICAL—heavy duty maintenance paint, under TROD

Bonderite, Bonderized, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.



For more data circle 351 on Postpaid Card

fications for black oxide finishes, the manufacturer reports.

Manufacturer: Mitchell-Bradford Chemical Co., Wampus Lane, Milford, Conn.

For more data circle **3** on Reader Service Card

★ ★ ★

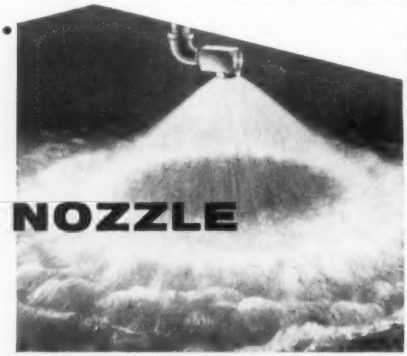
Vacuum Gage

An ionization gage that has longer life and resists oxidization and burn out if accidentally exposed to air has been introduced by NRC Equipment Corporation. Dubbed the BOP (for burn-out proof) model, the gage (Model 527) will indicate vacuums from 1 micron to 10^{-7} mm.Hg with a sensitivity of 100 milliamperes per micron. It is expected to be widely employed in vacuum metallizing, vacuum melting and heat treating, space simulation, and laboratory investigations.

A coated iridium filament that has superior resistance to burn-out at incandescent temperatures is the key to the unit's longer life. Compared with the tungsten filament that is used in standard ionization gages, this type has a much slower oxidization rate and this ensures longer gage life. Also, because the filament retains more of its original cross section and loses less ductility in service, it is said to be less subject to damage by shock and vibration.

Its burn-out resistance upon accidental exposure to air is equally important. While most vacuum gage controls are equipped with a protective circuit that turns off the filament if the pressure rises above a safe

(continued)



got a
SPRAY NOZZLE
problem?

perhaps one of our **DATA SHEETS** *can suggest a solution*

For almost every spraying application, there's a Spraying Systems Data Sheet that gives useful information on suggested installations and types of nozzles to use. If you have a problem, write and let us know the application involved . . . and we'll send the Data Sheet that applies.

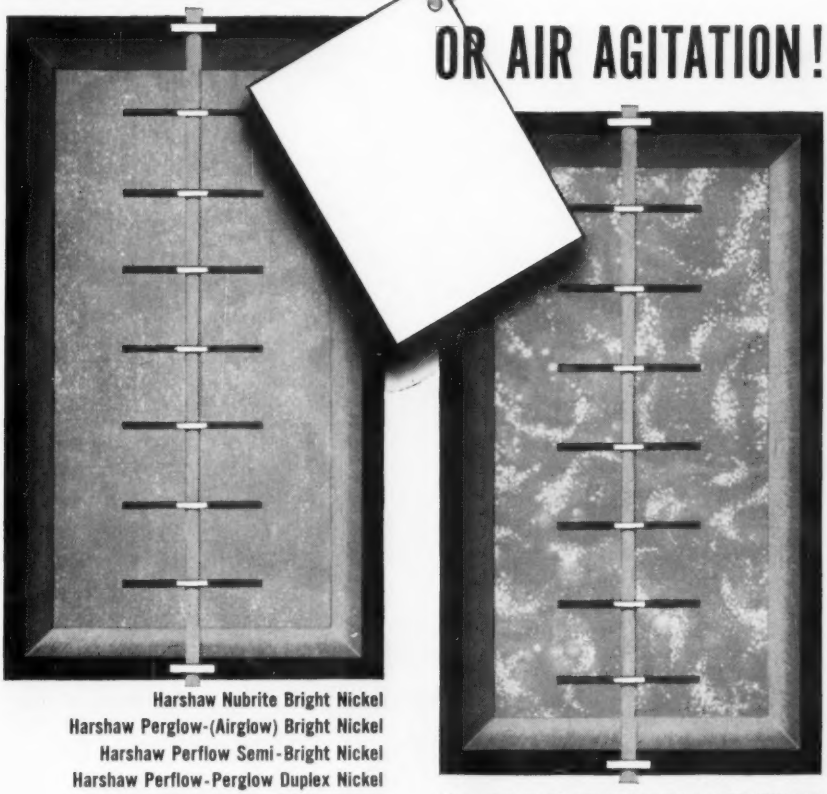
SPRAYING SYSTEMS CO.
3229 RANDOLPH STREET • BELLWOOD, ILLINOIS

And . . . for complete spray nozzle information, write for Catalog 24.

For more data circle 352 on Postpaid Card

All HARSHAW Nickel and Copper Plating Processes Operate Successfully with Either

CATHODE MOVEMENT OR AIR AGITATION!



Harshaw Nubrite Bright Nickel
Harshaw Perglow-(Airglow) Bright Nickel
Harshaw Perflow Semi-Bright Nickel
Harshaw Perflow-Perglow Duplex Nickel
Harshaw Cynorex Cyanide Bright Copper
Harshaw Cuprex Acid Bright Copper

All Harshaw processes have been highly successful in their operation with mechanical agitation. Where particular conditions have dictated the need for Air Agitation, Harshaw processes are operated very effectively with beneficial results. If your requirements indicate that Air Agitation will benefit you, Harshaw is prepared to offer a suitable process.

The HARSHAW Chemical Company

1945 EAST 97th STREET • CLEVELAND 6, OHIO

Chicago 32, Ill. • Cincinnati 13, Ohio • Detroit 28, Mich. • Houston 11, Texas Los Angeles 22, Calif. • Philadelphia 48, Pa. • Pittsburgh 22, Pa. • Hastings-On-Hudson, 6 N. Y.

For more data circle 353 on Postpaid Card

level, there is no practical way of interlocking a gage to prevent its being turned on accidentally when there is no vacuum in the chamber. This occasionally happens, and a gage having a tungsten filament will normally fail. The BOP gage will not. The thorium-coated iridium filaments have survived as many as 175 bursts from 1 micron to atmospheric pressure before failure.

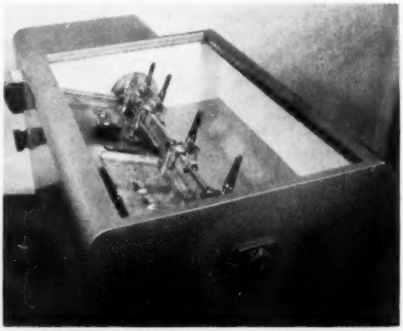
Model 527 gage is designed to be used with an NRC Model 710-B Thermocouple-Ionization Gage Control or other similar circuit. The filament rating is 5 volts at 5 amperes a.c.; the grid rating, -150 volts at 5 milliamperes; and the plate, -20 volts. Maximum emission current is 25 milliamperes.

Manufacturer: NRC Equipment Corp., 160 Charlemont St., Newton 61, Mass.

For more data circle **4** on Reader Service Card

Mask Washer

A mask washer recently introduced by Finish Engineering Company is said to clean the masks used in spray



Mask Washer with Turbo Rocker Action

decorating machines more quickly.

The heart of this machine is called

(continued)

Electro-polishing

Concentrates for

Aluminum and Alloys
Copper and Alloys
Carbon Steels
Stainless Steels
Plus Custom Concentrates for other metals

for fast, low cost

Burr Removal
Size Control
Corrosion Resistance
Micro-Inch Improvement
Electro Machining
Electroplate Adhesion

Electro-Glo

Electro-Glo produces finishes from satin to mirror-bright. We'll be glad to process your sample. Electro-glo offers nation-wide service and delivery in carboys, drums and tank trucks.

Electro-Glo Company, 621 South Kolmar Ave., Chicago 24, Ill.

For more data circle 354 on Postpaid Card

Completely new principle produces a stabilized, precision-metered curtain which coats ultra-smoothly at high speeds

How the NEW *GASWAY* *Kinetic-Kurtain* Coater

helps you improve finish, save material and increase production

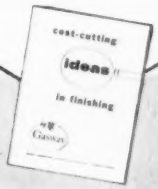
A new precisely metered gravity curtain of material! That's what gives you an ultra smooth coating film deposit at high speeds. Ends material loss . . . produces faster . . . smoother film . . . fast color changes . . . previous settings exactly duplicated . . . only two easy adjustments . . . many standard paints and finishes can be applied. Here is the finishing man's dream – fast, efficient, economical coating. Find out about this dramatic new machine today.

- Coats all materials
- Speeds from 50 to 450 FPM
- Applies many different finishes
- Explosion-proof design
- Coats up to 65" widths

25 Years' Experience In The Finishing Field

SEND FOR COMPLETE INFORMATION

Complete booklet gives details, specifications, recommendations. All the information you need to let you decide what Kinetic-Kurtain Coating can do for you. Write today for free booklet.



GASWAY CORPORATION

6463 N. RAVENSWOOD AVE.
CHICAGO 26, ILLINOIS
SHELDRAKE 3-1414

For more data circle 355 on Postpaid Card

the "Turbo Rocker." Masks are mounted on the Turbo Rocker, a revolving shaft which propels the masks in and out of the solvent. Thus the masks themselves agitate the solution as they plunge in and out.

Advantages of the machine, according to the manufacturer, are that less time is required for any given stripping job; loading is quick; it has a timed cycle; masks drain and dry because they are out of the solvent at the end of the cycle; the machine itself is easily cleaned; all mechanisms are air operated to prevent explosions.

Manufacturer: Finish Engineering Co., Inc., 921 Greengarden Rd., Erie, Pennsylvania.

For more data circle **5** on Reader Service Card

★ ★ ★

Sharper Coated Abrasives

Resin-bonded aluminum-oxide-coated abrasives with improved sharpness and cutting life have been developed by Behr-Manning Co., a division of Norton Company.

Marketed as Metalite Type 101, the abrasive is available on fiber discs and cloth belts.

A modification of the Type 101 abrasive, labeled 101T and applied to fiber discs in the grit range from 24 to 60 inclusive, has proved particularly effective on stainless steel, brass, bronze and other alloys. Increased abrasive life is accompanied by freedom from heating and resultant discoloration of the metal, Behr-Manning reports.

The Metalite Type 101 fiber

(continued)

Zooming TOWARD "NEW HORIZONS IN DETERGENT CHEMISTRY"

WITH CLEANING OF ALUMINUM AND SOFT METALS SILICATED OR NONSILICATED PRODUCTS FOR:

SOAK
SPRAY
FLOW APPLICATIONS

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RINSES } SOLVENTOL
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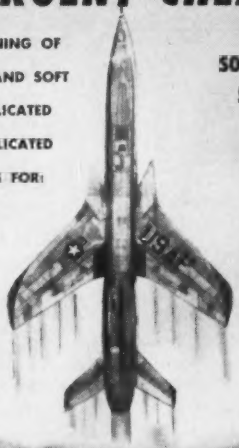
DI-PHASE®



WRITE OR PHONE FOR THE LATEST INFORMATION

Solventol CHEMICAL PRODUCTS, INC.
NEW HORIZONS IN DETERGENT CHEMISTRY
15841 Second Blvd. • TO 8-8466 • Detroit 3, Michigan

For more data circle 356 on Postpaid Card

discs are made in a grit range from 150 through 24; belts from 180 through 24.

Manufacturer: Behr-Manning Co., a division of Norton Co., Troy, N. Y.

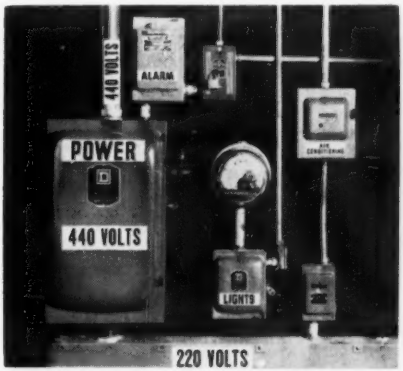
For more data circle **6** on Reader Service Card

★ ★ ★

Electrical Markers

Self-sticking conduit and voltage markers for identifying electric light, power and communication equipment are available from W. H. Brady Co.

The conduit and voltage markers provide a ready-made system of identification for electrical service equipment. Markings for conduits, busways, circuit breakers, control centers, switches, lines, switchboards, transformers and fuse boxes with both voltage and purpose printed in bold, black letters on universally-accepted bright orange backgrounds.



Brady Adhesive-Backed Electrical Markers

Manufacturer: W. H. Brady Co., Dept. CV, 727 W. Glendale Ave., Milwaukee 9, Wisconsin.

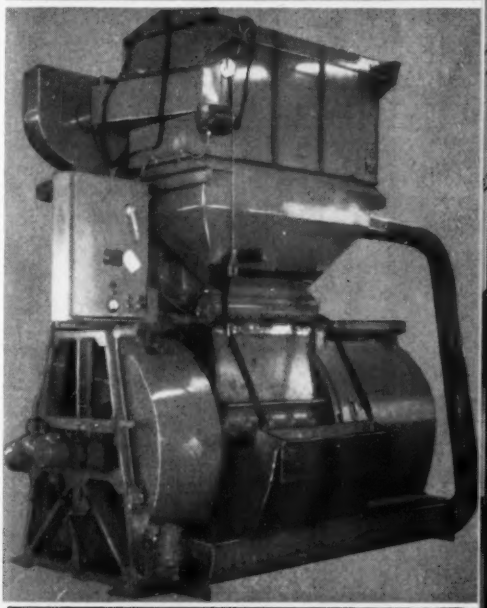
For more data circle **7** on Reader Service Card

★ ★ ★

Sprayed Foam Coating

Important advances in the fields of insulation and corrosion control are foreseen as a result of a development in sprayed rigid polyether-based urethane foams.

. . . the
HARPERIZER



Major BREAKTHROUGH
in Mechanical
FINISHING COSTS

NO BUFFS — NO FIXTURES

- 80% Savings on Labor and Materials by present users—same for short and long runs.
- HI—G—*Free Grain* — ACTION can produce similar savings on over half the jobs now buffed.
- FINISH—equal or superior to Buffing. Intricate detail and complicated shapes preserved.
- RANGE — All Metals — Most Plastics; sizes from watch screws to headlamps —

Ask for a Demonstration
Write or Phone (ANdrew 7-2553)
You can finish *better for less*
with the HARPERIZER

The HARPER BUFFING MACHINE CO.
EAST HAMPTON ● CONNECTICUT
For more data circle 357 on Postpaid Card

Foam developed by the Wyandotte Chemicals Corporation, and techniques and equipment for spray application worked out by The DeVilbiss Company combine to make this foam coating possible.

The rigid foam which results is self-adhering and can be sprayed on a vertical surface without sag or runs, using a DeVilbiss catalyst spray gun.

Heretofore, application of most rigid urethane foams has required the use of expensive positive displacement pumps. This development, DeVilbiss engineers state, reduces the cost of the equipment required.

Tests show that the rigid foam can be used for insulating and exterior of tanks, covering of pipes and pipelines and many other industrial installations where insulation or protection against corrosion is a factor.

To apply the liquid, two components are sprayed as liquids. Expansion begins instantly. The foam rises and sets tack free in less than five minutes. Up to seven inches of foam can be applied to a vertical surface without sag or drip. Flow is at the rate of from 3-5 pounds of material per minute with 10 to 20 board feet of coverage per min.

Density of the foam is 2.5 to 3.5 lbs. per cubic foot. After setting, the foam can be finished with paint or other material, if desired.

The K factor (B.T.U./sq. ft./hr./in./deg. F.) of this gas-containing foam is about 0.14 for a 2 pound-per-cubic-foot foam.

(continued)

LARGE WORK SPACE
Bench Oven 3' x 3' x 3'

MODEL 333

Another

GRIEVE-HENDRY STANDARD

Well constructed, efficient Bench Oven with Large Work Space. Especially adaptable to production line work on large units that require heat processing. Work space 36" x 36" x 36". Temperature range to 350° F. 1250 CFM forced air circulation. Stand available. Construction changes to suit needs. No engineering charges. Write for bulletin 2-157.

Quick Quotations
Prompt Delivery
Reasonable Prices
on Ovens Built
to Specifications

OTHER STANDARD MODELS — TO 1000° F—
$121.50 AND UP

Specialists in Heat Process Equipment

GRIEVE-HENDRY CO.

1341 N. Elston Ave., Chicago 22, Ill.

For more data circle 358 on Postpaid Card

KENVERT® NO. 11

best olive drab for zinc and cadmium

The General Electric Plant, Industrial Park, Syracuse, uses KENVERT No. 11 because a continuous olive drab film is obtained free of bruise marks on bulk work and connectors. This film absorbs the KENVERT No. 11-B to give a uniform black finish after dyeing.

By switching over to KENVERT No. 11 GE not only improved quality, but also enjoyed a cost reduction and these advantages:

KENVERT No. 11 ADVANTAGES

- Long Life
- Constant color
- Only one product required
- Stable non-varying solution as used
- Excellent corrosion protection
- Easy to dye
- Easy to control
- Available in non-returnable drums
- Meets requirements of government specifications on zinc and cadmium

Specify KENVERT No. 18-M

for economical, iridescent films *also with hard wet film strength* for bulk treating on zinc and cadmium.

WRITE for information and data on "compatible" brighteners for zinc and cadmium for chromate treatments.

CONVERSION CHEMICAL CORPORATION

99 E. Main Street, Rockville, Connecticut • Phone:TRemont 5-3357
Licensee: Nicromatic Ltd., Toronto, Canada
Distributors in major industrial United States cities

For more data circle 359 on Postpaid Card

Equipment required, in addition to catalyst spray gun: air regulator and transformer, two catalyst-type pressure-feed material-supply tanks, heat-jacketed Teflon and polyethylene lined hose, a heat exchanger and a heat generator.

Manufacturers: DeVilbiss Co., Toledo 1, Ohio (equipment) and Wyandotte Chemicals Corp., Wyandotte, Mich. (materials).

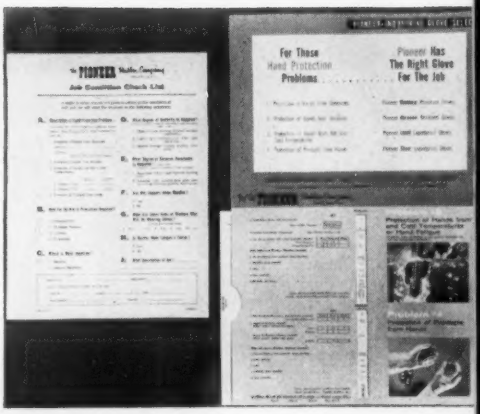
For more data circle **8** on Reader Service Card

★ ★ ★

Glove Selector

A "Foolproof Industrial Glove Selector" introduced by The Pioneer Rubber Company shows the "right" glove for any application with accuracy, speed and convenience.

The selector chart shows which gloves to choose for protecting hands from chemicals, abrasion and high temperatures; how to lessen worker fatigue, improve dexterity or protect products during handling.



Glove Selector: better hand protection

An added feature is the performance data chart which lists many chemicals used in industry and records the reaction of the glove materials as tested in these substances. This affords an extra check on the glove selected.

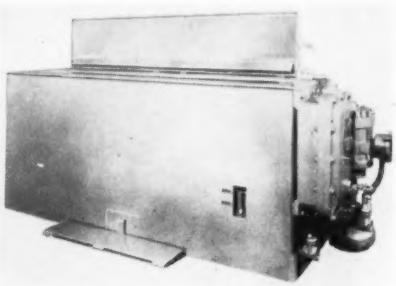
The selector may be obtained from The Pioneer Rubber Company, 296 Tiffin Rd., Willard, Ohio.

For more data circle **9** on Reader Service Card

★ ★ ★

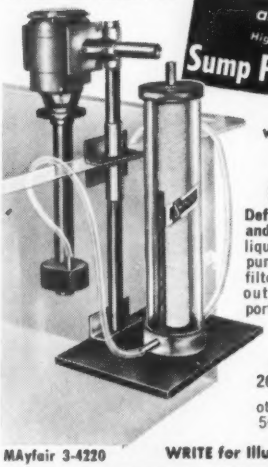
Automatic Mask Washer

A completely automatic high-pressure mask washing machine for large spray-decorating masks is designated



Conforming Matrix Automatic Mask Washer

NEW! Sethco all plastic High Temp. Epoxy Sump Filter Pump



with detachable FILTER CHAMBER

Defies chemical attack and heat. No loss of liquid, self-priming pump is in the tank—filter chamber on the outside. Compact, portable, economical.

Model UAL-20 200-300 Gals./Hr.

other models from 50-1500 Gals./Hr.

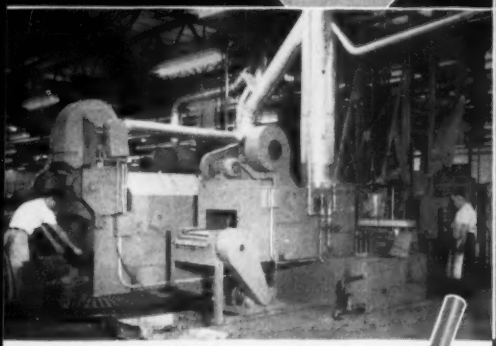
MAyfair 3-4220 WRITE for Illustrated Folder

Sethco Mfg. Co.
2292 Babylon Tpk., Merrick, N. Y.

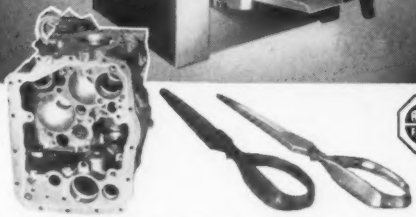
For more data circle 360 on Postpaid Card

For more data on advertisement on opposite page, circle 361 on Postpaid Card ——→

CALL ON **RANSOHOFF ROTO-FINISH** FOR *Engineering* FINISHING RESULTS



RANSOHOFF



ROTO FINISH

THIS AUTOMATED CLEANING AND FINISHING SYSTEM installed at Elco Tool & Screw Company, Rockford, Illinois removes wire coat from blanks; and washes, rinses, and dries 90,000 lbs. of finished nuts, screws and bolts per day. This system cleans tote pans automatically at the same time. Whether your production requirements are large or small, this is the kind of finishing *result* you can expect from Ransohoff.

A NEW VIBRATORY FINISHING MACHINE, the Vibratron, was designed by Roto-Finish to finish cast; forged and machined parts with shielded and hard-to-reach surfaces. It cleans, deburrs, descales, forms radii and fine finishes in very short time cycles. If desired, the Vibratron can be equipped to load and unload automatically.

THERE'S NO ROOM FOR GUESS WORK OR COSTLY HAND FINISHING TODAY. It's simply a matter of designing the right equipment and developing the right processing techniques for the job. Ransohoff/Roto-Finish, with a combined experience of 62 years in the finishing field know-how to solve your finishing problems quickly—efficiently—and economically.

Small wonder so many manufacturers, large and small, rely on Ransohoff/Roto-Finish to engineer finishing *results* with equipment and techniques they can depend on!

Get the Complete Story

Write for Ransohoff literature or request the Vibratron folder, today

RANSOHOFF/ROTO-FINISH

20 NORTH FIFTH STREET
HAMILTON, OHIO

as Model W-7200. This machine will handle masks up to 72 inches long, 18 inches wide and 16 inches deep.

The high-pressure spray produced by this machine permits up to 20 coats of wet paint to be removed in as little as 20 seconds, it is stated.

The cycle is adjustable from three seconds to 20 minutes. Self-cleaning filters are optional. Pumping facilities discharge the bulk of the contaminated solvent before sludge draining.

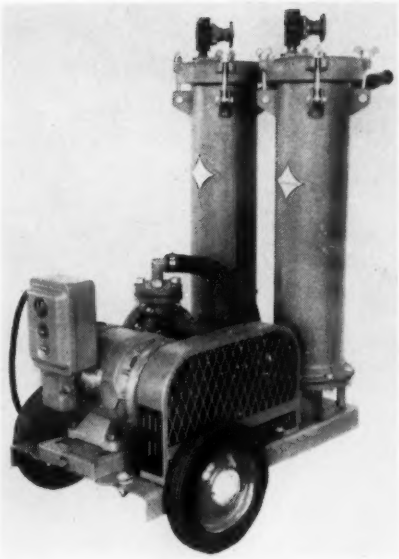
Manufacturer: Conforming Matrix Corporation, 356 Toledo Factories Building, Toledo 2, Ohio.

For more data circle **10** on Reader Service Card

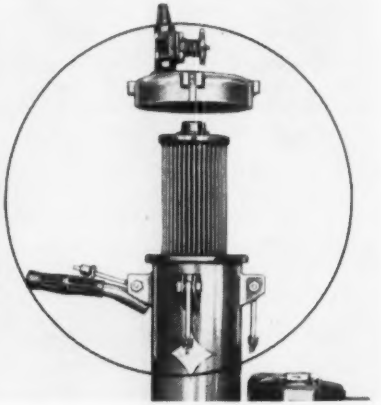
★ ★ ★

Portable Solution Filters

Two recently introduced plating filters are designed to eliminate piping and valves between tanks and the need for separate filter stations.



Industrial Type 118 Filter: 1200 g.p.h.



Type 118 filter is equipped with quick-releasing cover to facilitate change and inspection of cartridge-type filter element.

Designated as Type 118, two models are available. One provides 600-g.p.h.

(continued on page 114)

CASH for SCRAP CADMIUM

any quantity
any form

RESIDUES
CHEMICALS
METALS
ALLOYS

PROMPT SETTLEMENTS OR CONVERSIONS
SHIP TO REFINING PLANT:
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CHICAGO 12, ILLINOIS
Phone: SAcramento 2-3300

United Refining and Smelting Co.

PRODUCERS OF "HI-PURITY" METALS

ALSO BUYING PRECIOUS METALS – NICKEL – BISMUTH – TIN

For more data circle 362 on Postpaid Card

For more data on advertisement on opposite page, circle 363 on Postpaid Card

A UDYLITE TRIPLE PLAY . . .

ERNIE TO ELLEN TO JOHANNESBURG

Not customary but entirely "in order" is this shipment rushed by Udylite special messenger Ernie Jennings direct to planeside in Detroit, where Pan-Am stewardess Ellen Manners starts it on its way to South Africa. Just 39 hours later delivery is made in Johannesburg, 9036 miles away.

If your problem is as urgent as this, or if you just need quality supplies promptly delivered, you know you can count on Udylite supply services to meet your every demand. Discover how it works yourself. Place your next order with Udylite.

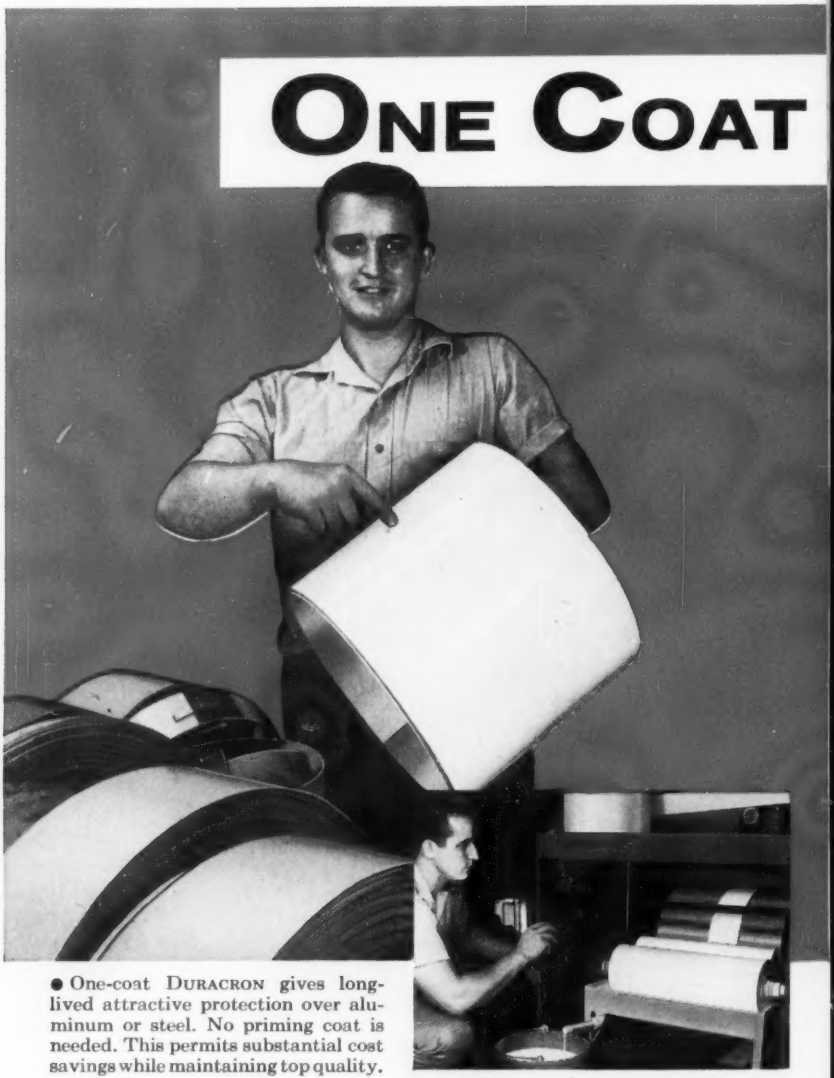
world's largest plating supplier

the **udylite** corporation

detroit 11, michigan

on the west coast: the l. h. butcher company • los angeles, california

ONE COAT



● One-coat DURACRON gives long-lived attractive protection over aluminum or steel. No priming coat is needed. This permits substantial cost savings while maintaining top quality.

PPG

PITTSBURGH INDUSTRIAL FINISHES

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

completely protects

aluminum siding and awnings when you use . . .

DURACRON

THERMO-SETTING ACRYLIC ENAMEL

● **Greater adhesion and resistance** to weather-wear and discoloration plus easy working properties make DURACRON an excellent one-coat finish for aluminum siding and awnings.

● **This remarkable thermo-setting acrylic enamel** is surprisingly hard and tough. Its mar resistance enables it to withstand rough handling in shipping and installation. DURACRON will not soften, even slightly, in hot sunlight—remains clean and bright under conditions in which vinyl- and alkyd-type finishes collect unsightly dirt and dust, which later streak and water spot.

● **DURACRON** has the outstanding colorability of acrylics. Its colors remain the same day after day. In production, white stays whiter and colors always match because DURACRON is affected far less by high or uneven oven heats and foul atmospheres which may yellow or dull other types of coatings. DURACRON assures longer life in service, too, as it withstands the corrosive action of weather, humidity and salt air. Exhaust and fuel fumes and industrial gases will not stain or discolor it.

Watch the Garry Moore Show—CBS-TV—Tuesday Evening

Mail This Coupon Today!

● DURACRON can be used advantageously to improve the appearance and performance of many products. Send for booklet which contains additional information that can save you time and money.

Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

Gentlemen: Please send me a copy of your free booklet on new DURACRON Acrylic Enamel.

Name _____

Address _____

City _____ County _____ State _____

Name of Company _____

COMPANY

For more data circle 364 on Postpaid Card

flow capacity and up to 15 square feet of filtration area. The other is rated at 1,200 g.p.h. and has 600 square feet of filtration area.

Both units are equipped with quick-releasing covers to facilitate change and inspection of cartridge-type filter element.

Furnished as a complete "package," Type 118 filters are equipped with rubber-lined centrifugal pump; 10 feet of suction hose; 15 feet of discharge hose; a combination ball-check foot valve and strainer; motor and starter with thermal overload. Bulletin 118 provides full details.

Manufacturer: Industrial Filter & Pump Mfg. Co., 5900 Ogden Ave., Cicero 50, Ill.

For more data circle 11 on Reader Service Card

★ ★ ★

Solid-Form Aluminum Etchant

Pennsalt Chemicals Corporation has introduced an aluminum etchant in solid form. Called AE-16S, the compound is an improvement over Pennsalt's flake-type aluminum etchant AE-16.

The recently introduced product is dustless, gives off no heat of solution, is easier to handle.

Like AE-16, the solid compound produces a durable satin etch on architectural aluminum, is non-scaling and eliminates sludge. As a result, etching tanks can be operated for longer periods between cleaning. Because no chipping or sludge shoveling is necessary, a simple washdown is all that is required.

AE-16S is packed as a solid block, which can be removed from the container and

(continued)

You can't beat Sanding with a
MITY-MIDGET
LIGHTWEIGHT, FAST, DEPENDABLE
Weighing only 4 pounds . . . yet so powerful you can't stall it by standing on it . . . this Air Driven, Orbital Action Sander gives a perfect finish, quickly and easily.

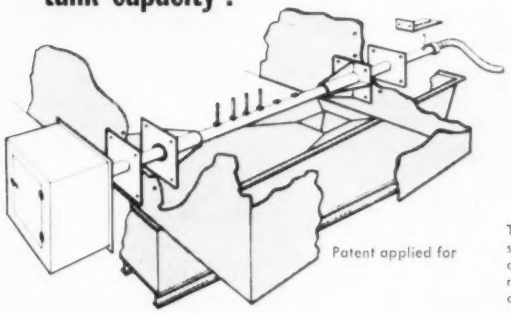
MODEL 400
NATIONAL D DETROIT
See how "Mity-Midget" can save you time and money. Write for a complete catalog today.
NATIONAL-DETROIT, INC., ROCKFORD, ILLINOIS
For more data circle 365 on Postpaid Card

AMAZING NEW IMPROVED FLOW COATING SYSTEM!

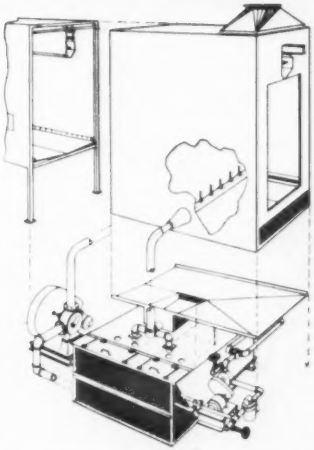
Uses 70% to 90% fewer nozzles!

Less solvent loss!

Reduces pump and storage tank capacity!



Patent applied for



This exploded view of a typical Flow Coater shows the simple application of a Koch* Oscicator to eliminate the complicated manifold, riser, nozzle, pumping, and piping system used on old type flow coaters.

* Trademark

The heart of the Koch Oscicator system is contained in the small control cabinet at the left. Paint manifold is drilled and tapped on 2" centers so that an exact nozzle pattern may be selected and the balance of the holes plugged.

The Koch Oscicator combines a two plane operation to develop a painting pattern with an absolute minimum of paint circulation and atomization. This two plane operation is adjustable to accommodate a complexity or variety of work. Newly installed systems use shorter tunnels, need less floor area. You get better quality flow coating with less paint, less solvent, smaller pumps.

IMPROVED FLOW COATING with these new features ...

smaller paint reservoir

smaller circulating pumps

less solvent loss

quick conversion

NO EXPENSIVE CHANGEOVER

No need to make an expensive plant shut down. Your flow coat enclosure remains just as it is and your maintenance crew makes the change over a week end by installing a Koch Conversion Unit. **Phone, wire, or write for expert Koch engineering assistance. No obligation.**

GEORGE KOCH SONS, INC.
Evansville 4, Indiana

For more data circle 366 on Postpaid Card

IMPROVED
BRIGHT NICKEL PROCESS

SEYMOUR **Hi-Thro**
(PATENT APPLIED FOR)

MORE THROWING POWER!
CLEANER, WHITER, BRIGHTER!

Seymour Hi-Thro is a new but thoroughly field-tested process that gives your product a **cleaner, whiter,** more **durable** bright nickel base than ever before possible! It completely eliminates the problem of dark deposits and provides an economical, mirror-bright base for a superb, sparkling, sales-building finish that will last and last!

What's more, Hi-Thro has more **throwing power** . . . gets deep into those hard-to-plate areas faster, more thoroughly — reaching into every nook, cranny and crevice to give your product the most economical, durable, uniform base plate possible today!

If superb, long-lasting finishes figure in your sales and profits picture, insist on new Seymour Hi-Thro Bright Nickel Process! There's no substitute!

• Fast brightness-building qualities • Broader, more uniform bright range • Excellent levelling action • Exceptional current density and temperature range • Wide pH range — 2.8 to 4.5 • Excellent ductility • Better corrosion protection • Good tolerance to impurities • Highly receptive to chrome plating • No toxic or unpleasant fumes

Send a test sample of your product — or write for a sample of Hi-Thro.

Electro Chemical Supplies Division
The SEYMOUR MANUFACTURING CO.
SEYMOUR, CONNECTICUT

For more data circle 367 on Postpaid Card

Pennsalt solid-form aluminum etchant AE-16S is packed in light metal containers that open with hand tools, or with a key available from Pennsalt. The solid block can be removed from the container and put into solution in minutes, with a minimum of agitation.

put into solution in minutes. The compound goes into solution quickly with a minimum of agitation.

Manufacturer: Metal Processing Dept., Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Pa.

For more data circle **12** on Reader Service Card

★ ★ ★

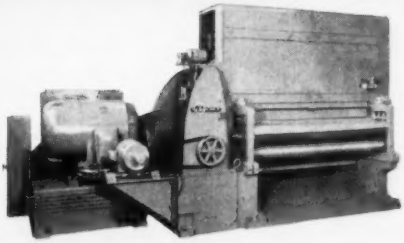
Process for Immersion Tinning of Aluminum Parts

A product recently introduced by Allied Research Products, Inc., aids in immersion tinning of aluminum parts.

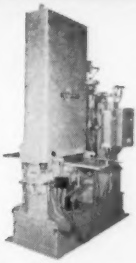
Called ARP Stannate "M," the product is a compound for make-up and maintenance of stannate-type tin baths.

Baths in which this product are used produce a smooth, adherent tin coating in four minutes immersion time, the manufacturer reports.

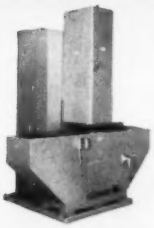
(continued)



THIS MASSIVE SHEET POLISHING MILL is a pinch-roll type machine to be used for wider flat stock grinding and polishing with belt widths up to 74 inches. A few applications include: prepolishing stock before forming; polishing stainless steel to standard finishes, upgrading finish of commercial rolled stock.

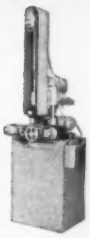


THE MODEL FSP-20 MACHINE is a high production, pinch-roll type for polishing of sheet, coil or bar stock. Printed circuits are typical applications for this model.



THE MODEL KC-8 MACHINE is a conveyor belt type for high production of miscellaneous shaped parts having flat surfaces to be ground, polished or deburred.

THE MODEL KP-8 MACHINE is a pinch-roll type for high production of sheets, coil or bar stock. Square or rectangular tubing and extrusions up to 4 in. thick are other common applications.



THE MODEL JC-6 MACHINE is a low-cost, high-production grinder and polisher. It is available either as a bench model with conveyor as shown, or the head can be used in conjunction with rotary tables.

ACME the complete line for flat grinding and polishing

These quality abrasive belt grinding and polishing machines are ruggedly built to resist vibrations and produce high-quality finishes. Made in five basic designs, they provide belt widths from 6 to 74 inches. Practically any kind of flat grinding, polishing and deburring operation can be expertly performed on these versatile units. Let Acme polish off your finishing problems. For complete information write:

ACME MANUFACTURING COMPANY

1400 E. 9 MILE ROAD, DETROIT 20, (FERNDALE) MICHIGAN

FOR HALF A CENTURY, LEADING PRODUCERS OF AUTOMATIC POLISHING AND BUFFING MACHINES

For more data circle 368 on Postpaid Card

The bath operates at 165-175 deg. F., produces little sludge, requires no control of hydroxide content or acetic acid additions. Only periodic checks for tin content required.

The bath does not deposit excessive amounts of tin in machined areas such as wrist-pin holes. With proper maintenance and additions, it should operate almost indefinitely without pumping, Allied Research states.

Manufacturer: Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Maryland.

For more data circle **13** on Reader Service Card

★ ★ ★

Immersion-Type Paint Stripper

Dytex No. 12 Stripper is an alkaline material that removes air-dried or baked organic finishes. Successful on melamines, most epoxies, zinc chromates, vacuum plated coatings, electric insulating varnishes and others.

How to Use: Article to be stripped is immersed in undiluted Dytex No. 12, heated to a temperature of 160-180 deg. F. Stripping takes 15 to 30 minutes. Stripped article should be rinsed with hot or cold water prior to refinishing. May be used on most basis metals with the exception of aluminum and magnesium. No effect on most types of rubber.

Manufacturer: Dytex Chemical Co., Providence 3, Rhode Island.

For more data circle **14** on Reader Service Card

★ ★ ★

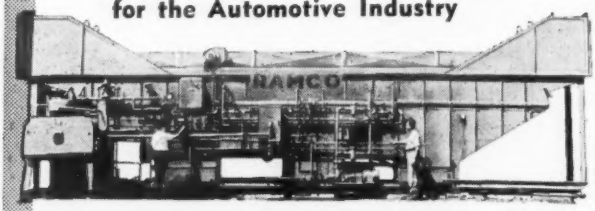
Mechanical Vacuum Pumps

Oil-sealed rotary mechanical vacuum pumps recently introduced by Consolidated Vacuum Corporation produce lower ultimate pressures than pumps of comparable capacity, and have equivalent speeds, the manufac-

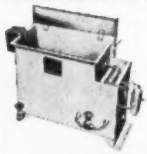
(continued)

RAMCO degreasers

from Laboratory Units to Giants for the Automotive Industry



ANOTHER RAMCO PRODUCT



LABORATORY DEGREASER

Giant Degreaser, made by Ramco for leading auto manufacturer.

Call on our engineering department for the latest in ULTRA-SONIC CLEANING.

Send for FREE CATALOG. Call your nearest Ramco engineer and have your metal cleaning equipment SERVICED AT NO CHARGE.

RAMCO EQUIPMENT CORP. Div. of Randall Mfg. Co., Inc.

811 Edgewater Rd., New York 59, N. Y. • DAyton 3-3900

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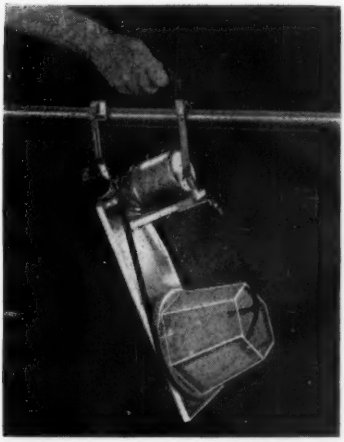


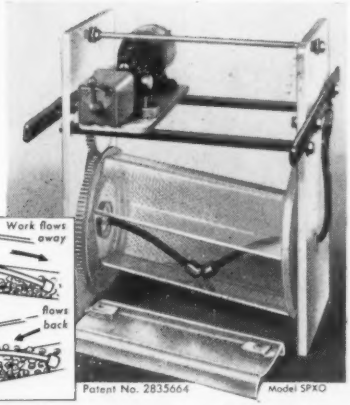
Permanent Tank Magnets

Have amazing pick-up strength. Recover parts from tank without stirring up sediment. Sort iron and steel chips and parts from brass, copper, zinc, sawdust, etc., like magic.

Furnished with or without wheels. Single, 3" wide Double, 8¼" wide Triple, 13½" wide Send for bulletin.

World's Handiest Small Lot Plater

Just load and hang on cathode rod of still plating tank. To unload just pour the work out. Plates any quantity from a spoonful to a pint in practically any solution. Adjustable tilt is held rigidly by two hooks. Send for literature.

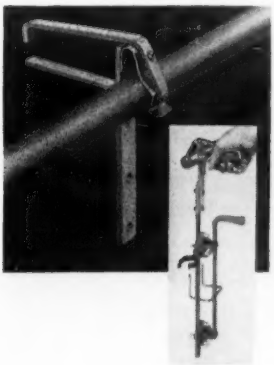


Rod Agitator for Small Tank!

The perfect answer to improved plating of printed circuits, precious metals, costume jewelry. For rods to ¾" diameter. Bolts to tank flanges. Furnished with or without tank. *BELKE makes rod agitators for tanks of all sizes. Send for bulletin.*

Improves plating – Saves money

Portoplater with Double Oscillating Cylinder that *ROCKS* as it *ROLLS*. Improved mixing action gives uniformity of metal deposit not even approached by ordinary cylinders. Plates specified thickness in less time, with less metal and less current. All sizes from 6x12 portables to 14x30 regulars. Send for bulletin.

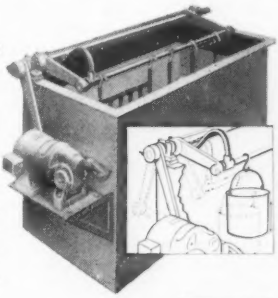


Motorized Slusher ⇨

Positive, churning action slushes work up and down. Solution flows in and out of intricate openings. Saves 90% of time required in cleaner bath.

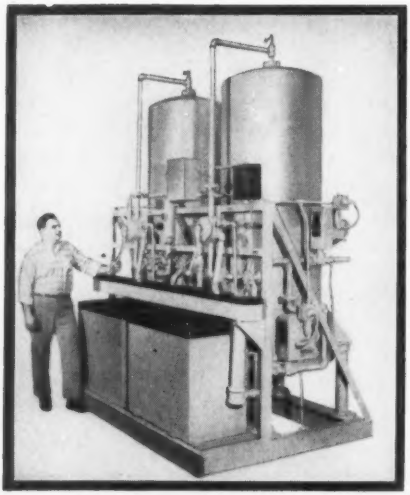
⇦ Positive Contact

Cathode hook with powerful spring clamp assures positive contact and full current conductance. Holds the rack exactly where put on the cathode rod. Made for rack stems and cathode rods of all sizes.



Belke MANUFACTURING COMPANY
947 N. Cicero, Chicago 51
EVERYTHING FOR PLATING PLANTS

For more data circle 370 on Postpaid Card



BARNSTEAD DEMINERALIZERS FOR METAL FINISHING IN CAPACITIES OF FROM 30 to 2500 G.P.H.

In rinsing or plating . . . in anodizing or make-up . . . in fact, wherever pure, mineral-free water is a necessity . . . Barnstead Demineralizers can save you money. First, because they are versatile: they come in all sizes from 30 to 2500 gallons per hour and in mixed-bed, two-bed, and four-bed models. Second, because they are low-cost in operation, producing pure water for as little as 5c per thousand gallons. Third, you get authoritative answers from Barnstead — with over 75 years' experience in ALL phases of producing pure water for all industrial applications.

NEW LITERATURE:

Catalog 127-A illustrates Barnstead's complete line of water demineralizers, and presents factual information which can help you reduce waste and save money.

Barnstead
STILL AND STERILIZER CO.

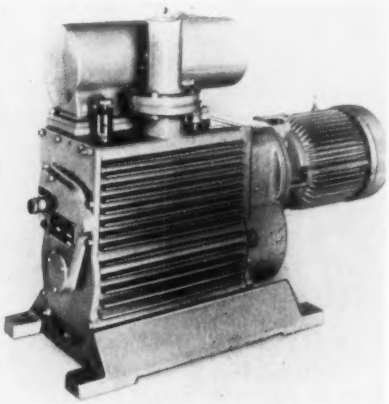
12 Lanesville Terrace, Boston 31, Mass.

For more data circle 371 on Postpaid Card

turer reports. Capacities of the nine pumps in this line range from 7 to 106 c.f.m.

The noise produced by mechanical pumps has been eliminated by an air-valve suppression port, and by reduction of vibration through static and dynamic balancing of the entire piston-drive assembly. Even at highest speeds and lowest pressures, operation is quiet and smooth, CVC states.

Each of these new positive displacement pumps is equipped with a gas



CVC Mechanical Vacuum Pump: quiet, smooth

ballast to speed the evacuation of large volumes of water vapor. This gas ballast can be by-passed when water vapor conditions are not severe or when lower pressures are required. Ultimate pressure is 2×10^{-3} mm Hg or lower with the single-stage pumps, and 2×10^{-5} mm Hg or lower with the double-stage pumps.

Manufacturer: Consolidated Vacuum Corporation, Rochester 3, N. Y.

For more data circle **15** on Reader Service Card

★ ★ ★

Non-Acidic Barrel Finishing Compound

Esbec Barrel Finishing Corporation has introduced a neutral, non-abrasive

shapes and lengths
for every need with
OFHC® ANODES

If you have been searching for a *really long* anode that's ideal for close spacing, ask your OFHC Anode distributor about the 1½ x 3-inch oval, available up to 8 feet long! Or if you're using anode baskets, ask him about replacing forged balls with short slugs of OFHC 2-inch rounds. Whatever your anode shape requirements might be, you'll find an OFHC Anode that fits precisely, and in any length to 96 inches:

- 3″ round
- 2″ x 3″ oval
- 2″ round
- 1½″ x 3″ oval
- 1½″ x 5″ flat

And no matter which OFHC Anode shape you specify, you will be ordering the purest copper commercially produced. OFHC Anodes are 99.99+% copper, completely free of oxides, uncontaminated by residual deoxidants. For free assistance in putting OFHC quality to work—in the shape and length you need—contact your OFHC Anode distributor, or AMCO Technical Service Section directly.

AMCO DIVISION
American Metal Climax, Inc.
61 Broadway, New York 6, N. Y.

OFHC Anodes—Made Only by American Metal Climax—are Sold by Leading Plating-Supply Distributors Everywhere.

For more data circle 372 on Postpaid Card

burnishing compound that eliminates the necessity for neutralizing after burnishing.

Used with chips or steel media, the compound (Esbec No. 134) is useful in cleaning, light descaling, bleaching and burnishing. It also removes rust, oxide stains and light heat-treat scale from steel and stainless steels. Can be used in processing copper, brass, beryllium copper, other metals.

As a bleaching agent, this compound removes darkening from parts after long cutdown runs in aluminum oxide chips or abrasive compounds.

Excellent results are obtained when restoring lustre to steel burnishing balls. Removes film and brightens in 30 minutes or less.

Manufacturer: Esbec Barrel Finishing Corp., 190 Henry St., Stamford, Connecticut.

For more data circle **16** on Reader Service Card

★ ★ ★

Air-Driven Agitator

An air-motor-driven agitator developed by Sprayma-

Air-Motor-Driven Agitator

tion, Inc., is explosion-proof. It cannot be damaged by overloading or stalling.

Stainless steel shafts and propellers are standard, with a variety of special stands and clamps available.

Models available with 1/10 to 4 h.p. Speed can be adjusted to

(continued)

CLAIR SURFACE FINISHING MACHINES

must be outstanding!

How else could you explain that 95 Repeat Customers have purchased a total of 664

SINCE 1947

CLAIR

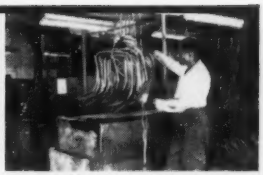
MANUFACTURING CO., Inc., OLEAN, N.Y.

Offering the Most VERSATILE Line of Surface Finishing Machines

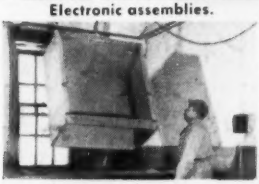
For more data circle 373 on Postpaid Card

Electronic assemblies.

Air conditioning equipment.



Metal specialties.



Large metal cabinets.

Machined parts assemblies.

Heater parts.

How to get all the benefits of low cost metal cleaning *plus* A SHORTER PAY-OFF PERIOD

cuts costs-per-piece cleaned with the most efficient degreasers available today.

With Phillips you get *speed* in your metal cleaning. This means you get out more work, pare down unit costs. Your cleaning investment pays out quicker. Faster return on your money!

All this is possible because Phillips designs for the greatest possible efficiency. Each machine is designed to give you the highest possible output for its size.

Also, Phillips can show you how to use automated degreasing equipment to cut costs further. Call in your Phillips man today and discuss lower cleaning costs. He'll be glad to talk it over at no obligation. Phillips Manufacturing Co., 3457 West Touhy Avenue, Chicago 45, Illinois. AMbassador 2-6020.

Phillips

Complete

FACTS AVAILABLE

Send for Phillips' material on vapor degreasing as it affects production costs. You'll find many questions answered and also a great deal of information on our standard and special machines. Engineering data is given for individual models. This will help you decide what machines fit your job best.

ENGINEERED SERVICE

SEND TODAY

For more data circle 374 on Postpaid Card

you can tell

CRES-LITE

BRONZE POWDERS

are Pure, Brilliant Metallic Bronze!

- **by the brilliant sheen and full-bodied lustre!**
- **by the coverage—less cost per square inch of finished product!**

Unequalled for smoother, more brilliant Plated-Effect Finishes—by spray, dip or flow coating.

IN STOCK—tremendous selection of colors including popular metallic pastels, statuary and antique shades.

COLORS MATCHED—with no variance in quality, color or lustre from batch to batch. Fast service guaranteed.

SPECIAL COLORS—Over 25 years experience in creating special colors and shades for the plastic and metal finishing trades. Satisfaction assured.

write for yours now!

NEW COLOR CARD FREE!

Full Range of Colors for Immediate Delivery

CRESCENT BRONZE POWDER CO.

118 W. ILLINOIS STREET, CHICAGO 10

1841 S. Flower St., Los Angeles 15

For more data circle 375 on Postpaid Card

suit requirements. Units are lightweight and portable.

Manufacturer: Spraymation, Inc., 25 Amity St., Little Falls, N. J.

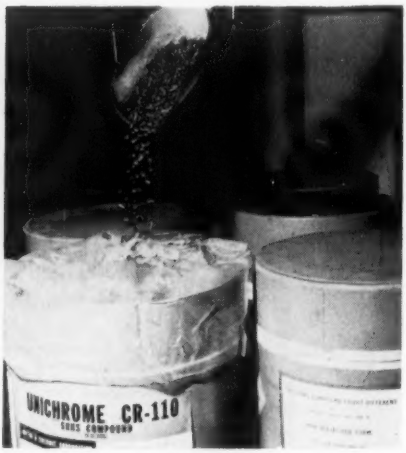
For more data circle **17** on Reader Service Card

★ ★ ★

Pelletized Chromium Plating Chemicals

Chromium plating chemicals are now being made by Metal & Thermit Corporation in the form of pellets to improve user safety and convenience.

The pellets, approximately ¼ by ¾ inch in size, can be shovelled or poured readily without dust. There is no caking and less tendency for the chromic acid to pick up moisture or adhere to the sides of the container, the manufacturer reports.



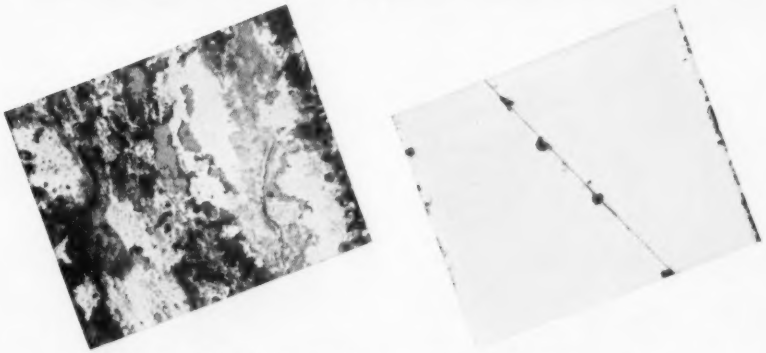
Metal & Thermit's Chromium Plating Pellets

Safety is the biggest advantage, M&T points out. Without caking, there are no large lumps which could cause splashing when dumped into a plating bath. The small size of the new pellets virtually eliminates this problem.

Manufacturer: Metal & Thermit Corporation, Rahway, N. J.

For more data circle **18** on Reader Service Card

Which panel took the longest salt shower?



The one on the right — the steel panel protected before painting by Wyandotte PRE-FOS®

The painted steel panel showing by far the least corrosion damage was exposed to A.S.T.M. standard salt spray *154 hours longer* than the badly rusted one! . . . proof of the effectiveness of PRE-FOS in the preparation of metals for painting.

Wyandotte PRE-FOS simplifies processing by cleaning and phosphating in a *single* operation; deposits a fine-grained, corrosion-resistant iron phosphate coating, which saves paint and provides superior impact resistance.

What's more, PRE-FOS prevents rusting of "in-process" steel parts; may be adapted for spray-washing or soak-tank use.

Improve your "finish" with PRE-FOS. Get details from your Wyandotte man, today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Above, unprotected steel panel (left), degreased and painted — exposed to 96 hours of salt spray, compared to panel (right) protected by PRE-FOS before being given identical coat of paint and exposed to *250* hours of salt spray!

Wyandotte CHEMICALS

J. B. FORD DIVISION

THE BEST IN CHEMICAL PRODUCTS FOR METAL FINISHING

For more data circle 376 on Postpaid Card

WRINKLES?

for use on plastics?

on polystyrene?

and on metals too?
*

*right... wherever the maximum baking temperature is under 200°F.

DURALAC CHEMICAL CORP.
84 LISTER AVENUE, NEWARK 5, N. J.

For more data circle 377 on Postpaid Card

New Products . . .

Improved Vibrating Finisher

An improved model of the Roto-Finish Vibratron which eliminates the need for manual loading and unloading of parts and media has been developed by the Roto-Finish Co.

A built-in, removable, double-decked vibrating separator in the base of the machine separates parts and media, as well as fragments from the media, in one simple operation. There's no need for an extra separator.

Vibratron: separates parts from media

The machine can be hopper-fed, and the design permits discharge of finished parts onto a conveyor where they move on to the next operation.

Primarily designed to finish complex cast, forged, stamped, and machined parts with hard-to-reach shielded and internal surfaces, the machine makes possible short time cycles. With automatic discharge onto a conveyor, this model may be made a part of a production line.

Manufacturer: Roto-Finish Company, 3704 Milham Rd., Kalamazoo, Michigan.

For more data circle **19** on Reader Service Card

LOW COST PRECIOUS METALS PLATING WITH PORTABLE AUTOMATIC MACHINE

NEW Sel-Rex JET PLATER®

A complete electroplating plant in a streamlined cabinet measuring only 34" x 28" x 33" high. Several new models permit either rack or barrel plating with any cold alkaline solution and most of the usual acid solutions. Quality plating at high speed is possible through the ideal system of a pump and jet orifice manifold at the bottom of the plating tank. Constant swirling of the solution around the work assures smooth, even deposits at higher speeds than possible through mechanical agitation methods.

Completely automatic in operation, the Jet Plater features a panel board containing dual scale ammeter, powerstat control for rectifier, circuit breakers, and automatic timer which sounds alarm upon completion of the plating cycle.

Literature on request.

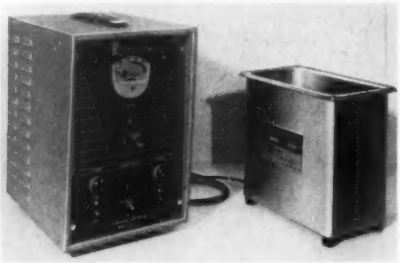
SEL-REX CORPORATION
NUTLEY 10, NEW JERSEY

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies.

For more data circle 378 on Postpaid Card

Ultrasonic Cleaning Unit

National Ultrasonic Corporation has introduced an ultrasonic cleaning unit for use in processing small parts where average energy levels are required.



National Ultrasonic's Model 100 Cleaner

Model 100 in the company's Standardline, the unit has a one-gallon stainless steel tank. Twenty-five per cent of the tank bottom is covered with driving elements and actual radiating surface is about 12 square inches.

The 115-volt-a.c. single-phase, 60-cycle generator delivers an average power output of 60 watts and produces peaks of 240 watts. One-tube oscillator, front-panel switching, choice of either of two transducers, and 3-wire ground protection. Interlocked for operator safety, the unit can be adjusted to available line voltage.

Manufacturer: National Ultrasonic Corporation, 111 Montgomery Ave., Irvington, N. J.

For more data circle **20** on Reader Service Card

★ ★ ★

Dry Acid

Aricid B, a dry powder that is completely soluble in water, substitutes for muriatic and sulfuric acids in activating dips for steel, copper, brass and zinc die castings. It is also used in solutions for removing rust, heat-treat scale, oxides, soldering flux, and as a chromium stripper.

The dry powder is a mixture of acid

FICTION and FACT

FICTION: Paint Overspray Control Requires Complicated and Expensive Maintenance Procedure.

FACT: An R P Paint Arrestor Equipped Booth Can Be Changed In Minutes By Inexperienced Personnel.

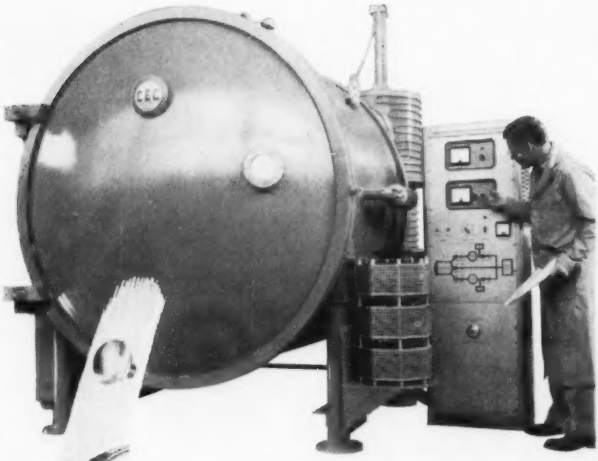
RP® PAINT ARRESTORS

Photo Courtesy Burnaby Blinds Ltd., Winnipeg, Canada

Inexpensive R P Paint Arrestors are easily replaced in a short time to provide like-new paint overspray removal efficiency, with minimum down-time, at a fraction of usual maintenance costs. Economical original installation, too—and adaptable to almost every type operation, R P Paint Arrestors can cut costs, increase production in your booths, too. Write for information.

RESEARCH PRODUCTS Corporation
Dept. 38, Madison 10, Wis.

For more data circle 379 on Postpaid Card



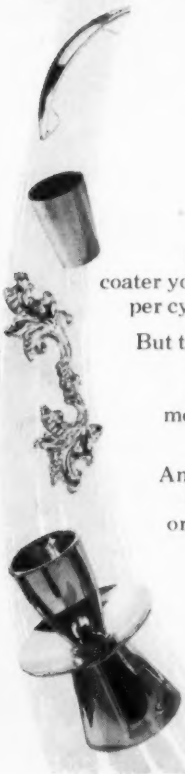
NOW! THINK BIG for BIGGER PROFITS in METALLIZING

Here's the BIG news in vacuum coating. With this new 72" CEC coater you can put rich, lustrous metallic surfaces on thousands of pieces per cycle—or on bigger pieces up to 22" x 50"—4 or 5 cycles per hour!

But there's much more than volume capacity to the profit story. With CEC coaters of any size, you'll find that actual coating costs are lower than by any conventional method. A dime's worth of most metals will do thousands of pieces. Easy to use, too; no skilled help needed, no profit-consuming training programs.

And you profit from uniform high quality. Surfaces metallized in a CEC coater are so bright and gleaming that they need no buffing or polishing. New long-life lacquers, low in cost and easy to apply, keep them that way.

WRITE for application data and specifications on the complete CEC line. Just ask for Metallizing Bulletins.



Consolidated Vacuum Corporation

ROCHESTER 3, NEW YORK

A SUBSIDIARY OF CONSOLIDATED ELECTRODYNAMICS CORPORATION
(FORMERLY ROCHESTER DIVISION)

For more data circle 380 on Postpaid Card

salts, activators, corrosion inhibitors, and surface active agents.

The manufacturer reports that use of this material has the following advantages: eliminates carboys; requires no special storage space; eliminates danger of acid spillage; requires no acid pumps; improves activating and wetting properties of solutions.

Manufacturer: Heatbath Corporation, Springfield 1, Mass.

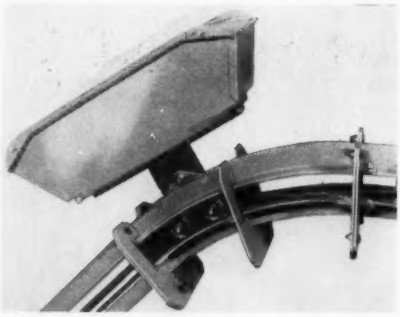
For more data circle **21** on Reader Service Card

★ ★ ★

Pallet and Pan Conveyor

Pallets and pans can be carried through a plant riding a few inches above the track of an American Monorail trolley conveyor installed "upside down" in relation to the normal position for an overhead conveyor.

Pitching and twisting of the pallet or pan when the conveyor is in motion and when stopping and starting is prevented by design of the trolleys on this conveyor, the manufacturer states.



Trolley Conveyor Carries Pans, Pallets

Trolleys have eight wheels: four for horizontal support and four to roll against the sides of the rail on horizontal curves. Thus the trolley cannot pitch or yaw, even with a loaded pan on it.

Manufacturer: Conveyor Division, American MonoRail Co., 4th and Franklin Sts., Tipp City, Ohio.

For more data circle **22** on Reader Service Card

FOR BETTER FINISHING AT LOWER COST . . . USE

BURNISHING SHAPES and DE-BURRING MATERIALS

***by* ABBOTT . . . A LEADING MANUFACTURER OF FINISHING MEDIA SINCE 1909**

SIZE RANGE OF ABBOTT SHAPES:

BALLS (Abco)	3/32", 1/8", 5/32", 3/16", 7/32", 1/4", 9/32", 5/16", 11/32", 3/8", 13/32", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4".
BALLS (Eclipse)	3/32", 1/8", 5/32", 3/16", 7/32", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4".
OVALBALLS	1/8", 5/32", 3/16", 1/4", 5/16", 3/8".
BALLCONES	1/8", 3/16", 1/4", 5/16".
CONES	1/8", 3/16", 1/4", 5/16", 3/8", 1/2".
DIAGONALS	1/16", 3/32", 1/8", 5/32", 3/16", 7/32", 1/4", 5/16".
PINS	1/32" x 3/8", 1/16" x 7/32", 1/16" x 1/2", 1/8" x 3/8", 3/64" x 1/2", 3/64" x 3/8".

for complete information on prices and applications write to

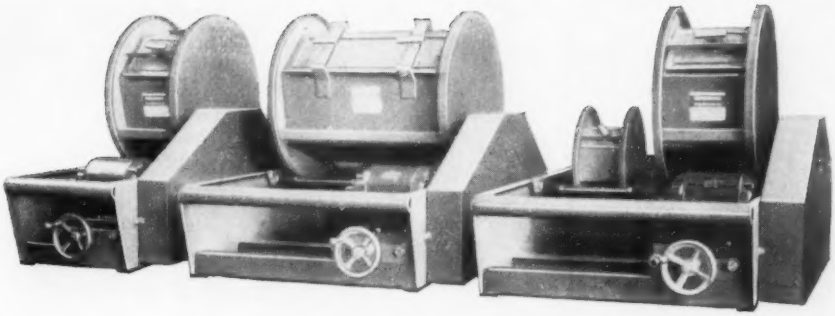
1/32" and 1/16" ABBOTT PEBS (processed, chilled shot) also available.

ABBOTT — a HALF century of WHOLE service to industry — 1909 1959

THE ABBOTT BALL COMPANY

RAILROAD AVE. WEST HARTFORD 10, CONN.

For more data circle 381 on Postpaid Card



pack big finishing capacity in small portable machines

Here are the lowest cost machines available anywhere for portable, precision finishing. They give you more versatile, flexible capacity than ever before. They are fast, rugged, quality-built to the same precision standards of larger, more costly machines.

The features: install just one basic drive unit, then select barrels in any combination to fit your needs. Loading or unloading of barrels is fast—just lift them off the neoprene drive rollers. Dual drive shafts, safety enclosed belt and pulleys, and 20 to 46 rpm variable speed drive give you real performance. And you can choose your barrel size from 2 quarts, 0.5 and 1.1 cu. ft. capacity. Cost is surprisingly low.

The details: Send today for complete data on the Model RA machines, Rampe Manufacturing Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

Industry's Most Complete Line

RAMPE

PRECISION BARREL FINISHING MACHINES

For more data circle 382 on Postpaid Card

ZINC DIE CAST and ALUMINUM CLEANERS

- **Completely water soluble**
- **Faster removal of buffing compounds**
- **Harmless to rack coatings**
- **Economic operation**

Benchmark zinc die cast and aluminum cleaners more efficiently remove stubborn soils and buffing compounds in a shorter time. These non-toxic, odorless cleaners are non-flammable. Benchmark cleaners eliminate degreasing.

For more detailed information about your complete metal cleaning needs ask for Benchmark technical service.

BENCHMARK, INC.

Reference Point for Exacting Performance

1060 ARCH ST. • WYANDOTTE, MICH.

AVenue 5-0900

For more data circle 383 on Postpaid Card

Nickel Plating Process

Hanson-Van Winkle-Munning Company has introduced a bright nickel process called Superlume, which, according to the manufacturer, gives a bright, smooth nickel deposit.

The Superlume process yields deposits which are exceptionally bright in high and low current density areas and it has the ability to level-out scratches, H-VW-M reports.

The process is also characterized by an excellent tolerance to inorganic impurities such as zinc and copper and the bath is amenable to continuous carbon treatment, resulting in relative freedom from organic contamination.

H-VW-M says that in laboratory and field tests, the bright nickel bath has proved simple to control and easy to operate.

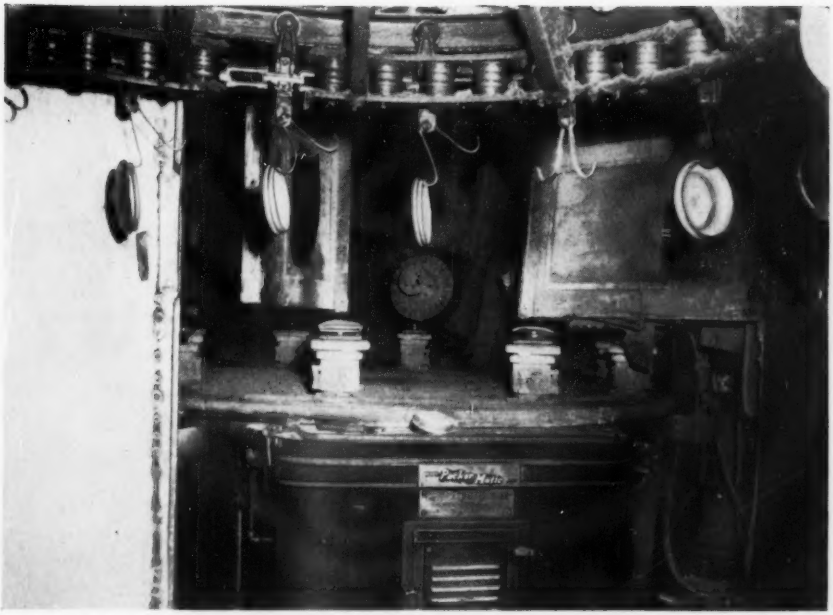
Conversion of existing baths to the Superlume process is relatively easy. A gallon sample of existing baths should be sent to the H-VW-M laboratory for exact conversion instructions.

Agitation has a beneficial effect in producing bright, smooth, uniform deposits. It may be provided by conveyor motion, mechanical means, cathode rocker or air. The latter is preferred. A still bath variation is also available.

Manufacturer: Hanson-Van Winkle-Munning Co., Matawan, N. J.

For more data circle **23** on Reader Service Card

Finish produced by the Superlume Plating Process is examined for brightness and uniformity.



24 million pot lids can't be wrong!

Ask your wife. She will tell you about famous Revere Ware. Probably best known by their copper bottoms, the durable luster of pots and pans by Revere is taken for granted.

"Taken for granted" is exactly the phrase applied to the 3 Packer-Matic polishing and buffing units in Revere's Rome, N. Y. plant by Mr. F. W. Merry, Assistant Works Manager. "We feed them and our Packer-Matics do the rest," says Mr. Merry. "They haven't failed us in 23 years of high production rate operation." "They get a good clean up twice a year and that's about the extent of our maintenance."

Achieving highly reflective finishes on pot lids is only one of hundreds of polishing, deburring, buffing and cleaning applications Packer-Matics have handled since Mr. Clifford I. Packer turned out his first unit in 1927. Chances are we can help you in your finishing operations, too. Send us samples with your specifications or blueprints and see.

Production reliability makes Packer-Matic the choice of companies like Revere Copper and Brass Inc.

COPPER CLAD STAINLESS STEEL 18 01 REVERE WARE

PACKER-MATIC

THE PACKER MACHINE COMPANY • MERIDEN, CONN.

Pioneer Manufacturers of Automatic Polishing & Buffing Machines

For more data circle 384 on Postpaid Card

$500 for the best articles . . .

Awards for the Best Papers on Electroplating and Industrial Painting

Write an article on finishing in your plant . . .

Your story on finishing could be the one the judges are looking for in the PRODUCTS FINISHING Article Competition.

Articles packed with practical information on painting or electroplating will be the ones that will impress our judges. You don't have to be a professional writer nor the discoverer of the method that will revolutionize finishing practice. Briefly, here's what you do have to write as an entry:

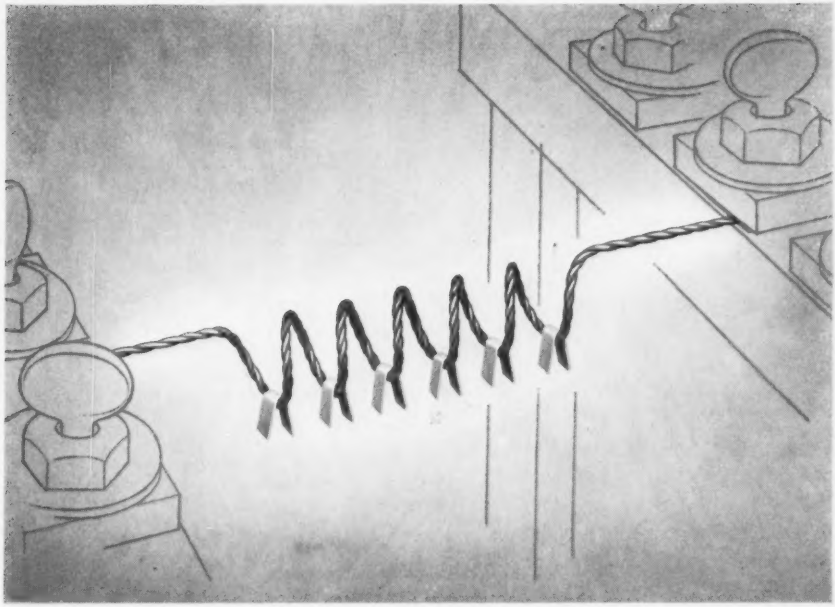
For Platers: a paper describing how a design, engineering or manufacturing problem in your plant was solved by electroplating; how plating improved your product or manufacturing efficiency.

For Painters: an article describing how a durable and/or attractive paint finish is produced in your plant; specific information on the methods and materials used, how they are used, why they are used, what kind of finish they produce and why it's durable and attractive.

Hurry! The contest closes for platers on February 1, 1960, and for painters on October 1, 1960.

Awards: Separate awards for the best papers in each category—painting and electroplating. $500 top awards, $250 second awards, five $50 awards.

For more details write to Article Competition, c/o PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio. Request rules for Painting Competition or Electroplating Competition. All articles submitted become the property of PRODUCTS FINISHING.



New *high-performance tungsten strand makes better vacuum metallizing coils*

Vacuum metallizers who wind their own coils will benefit from the controlled re-crystallization rate built into Sylvania's new metallizing strand. Not only will coils be easier to produce, but they will have a much greater shot life. Controlled re-crystallization reduces brittleness and twisting, minimizing premature breakage during reloading and processing.

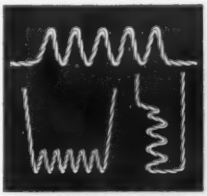
This new Sylvania wire has been thoroughly service-tested in many types of coils. Its uniformity and freedom from splits are assured by electronic quality-control testing during production.

Your Sylvania Field Sales Engineer will be glad to supply you with complete details. Call him now.

These sizes now in production:

No. of strands		Wire Size Inches	No. of strands		Wire Size Inches
2	x	0.030	3	x	0.040
3	x	0.020	4	x	0.015
3	x	0.025	4	x	0.020
3	x	0.030	4	x	0.030
3	x	0.030 (with 0.025" aluminum core)			

Write for new technical bulletin



Sylvania "Readymade", Coils 164 standard types

If you prefer, Sylvania will supply precision wound coils in standard shapes and sizes. They're all described in the Sylvania coil catalog. Or let us bid on your special requirements.

SYLVANIA GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

Sylvania Electric Products Inc.
Chemical & Metallurgical Div.
Towanda, Penna.

For more data circle 385 on Postpaid Card

FREE LITERATURE

40. Rotary Automatic Polishing Machines
Twelve pages of data on rotary automatic polishing and buffing machines. Photos and descriptions of many different models and types. List of accessory equipment and supplies. Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

41. Spindle Machines
Eight pages. Machines for finishing precision parts in loose abrasives by attaching to fixtures which travel through the abrasives. Almco, Queen Products Div., King-Seeley Corp., 810 E. Main St., Albert Lea, Minn.

Park No. 290
BLACKENING SALT

- Fast . . . simple one bath operation.
- Excellent bond for paints and enamels.
- Water solution—no electric current.
- Permanent black finish on tools, ordnance parts, aircraft, bearing races.
- Decorative finish for business machines, hardware, television cameras, metal screens, machine parts.

Write for bulletin H-16. Park Chemical Co., 8074 Military Ave., Detroit 4, Michigan

For more data circle 386 on Postpaid Card

42. Demineralizers
Catalog 127A. 20 pages. Tells about the difference between distilled and demineralized water; lists typical applications for demineralizers; tells how demineralizers operate; describes different types. Barnstead Still & Sterilizer Co., 12 Lanesville Terrace, Boston 31, Mass.

43. Drawer-Type Ovens
Bulletin No. 201-4. Data sheet describes and illustrates vertical-drawer-type ovens for baking paint on such products as metal window frames, fence sections, metal panels and other flat products. Despatch Oven Co., 619 Eighth St., S.E., Minneapolis 14, Minn.

44. Complete Finishing Systems
Illustrated index of the complete finishing systems available from the DeVilbiss Co. Information on spray guns, automatic spray coaters, flow and dip coaters, industrial ovens, air compressors, dust collectors, spray booths, industrial power washers, hot spray systems, paint tanks and pumps, hoses and connections, phosphatizing systems. Form 325-1. DeVilbiss Co., Toledo 1, Ohio.

45. Leveled Copper Plating Process
Folder A-8956. Four pages. Photomicrographs and data on Du Pont's new leveled copper plating process. E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Wilmington 98, Del.

46. Duplex Nickel Plating Process
Four pages. Photomicrographs and description of the Perflow-Perglow Duplex nickel plating process. Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

47. Brightener for Stainless Steel
Technical Data Sheet No. 81. Four pages. Liquid acid material called Electro-Gleam 55, for brightening stainless steel, aluminum and steel. Solution removes

RONA T.M.
Synthetic Pearl Essence with the natural look!
PEARLESCENT FINISHES
BAKE OR AIR DRY FOR
Your Product Made of Metal, Plastic, Wood or Glass.
Write for sample. Specify application and choice of vehicle.
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East 21st and East 22nd Sts., Bayonne 4, N. J.
Plants: Main • New Jersey • Canada

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DECEMBER, 1959

1	17	33	49	65	81	97	113	129	145	301-2nd Cov.	330	346	362	378	394	410	426	442
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3	19	35	51	67	83	99	115	131	147	303-4th Cov.	332	348	364	380	396	412	428	444
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8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

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COMPANY _____

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1	17	33	49	65	81	97	113	129	145	301-2nd Cov.	330	346	362	378	394	410	426	442
2	18	34	50	66	82	98	114	130	146	302-3rd Cov.	331	347	363	379	395	411	427	443
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9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

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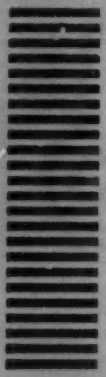

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scratches and other surface defects, deburrs and removes sharp edges, improves corrosion resistance and adherence of plated work, reduces friction. MacDermid, Inc., Waterbury 20, Conn.

48. Nacreous Pigment Handbook

Eight pages. Comprehensive data book provides specific details on the qualities of natural and synthetic pearl pigments and their characteristics. Mearl Corporation, 41 E. 42nd St., New York 17, N. Y.

49. Pelletized Chromium

Data sheet on new pelletized SRHS chromium plating compounds. Can be shovelled or poured without dust. Metal & Thermit Corporation, Rahway, N. J.

50. Hot Airless Spray

Eight pages. Good "popular" description of the airless spray painting process: theory and practical application. Advantages, equipment needed, answers to common questions. Nordson Corporation, Amherst, Ohio.

51. Practical Tips on Ultrasonic Cleaning

Alkaline and acidic detergents are frequently better for ultrasonic cleaning than the more viscous solvents. This is one of six practical tips given in a new service bulletin on ultrasonic cleaning. Describes compounds which have proven effective in ultrasonic cleaning, tells where ultrasonic cleaning does the best job. Bulletin No. 16A. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

52. Washing and Phosphatizing Equipment

Bulletin 659-1. 8 pages. Description of a pre-engineered modular power-spray washing and phosphatizing machine. Allows the user to add process stages as he needs them. Ramco Equipment Corp., 811 Edgewater Rd., New York 59, N. Y.

53. Electrostatic Spray Gun, Hand Held

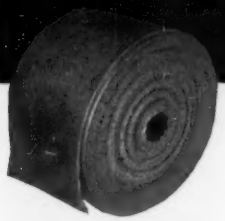
Six pages. "Spray Painting with the Electrostatic Hand Gun." Principles and uses of recently introduced hand-held electrostatic spray painting gun. Photos of production applications. Ransburg Electro-Coating Corp., P. O. Box 23122, Indianapolis 23, Indiana.

54. Technical Paper on Decorative Gold Plating

Seven pages. Metallurgical properties and applications for low-pH acid-type gold plating formulations, trademarked Karatclad. Data on bath maintenance, composition, dragout control, color-control methods, color measurement, light sources and their effects. Sel-Rex Corporation, Nutley 10, N. J.

For Dust Free Finishes!

BOND TACK CLOTH



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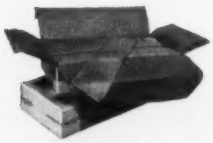

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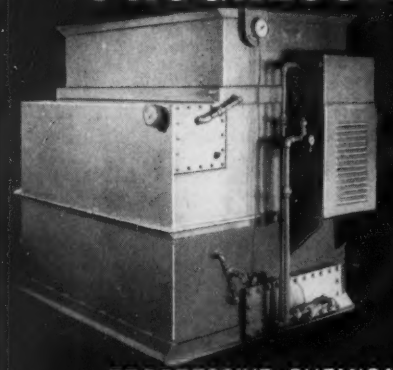

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55. Cast Copper Anodes
Four pages. Advantages of Talco 99.99 per cent pure copper cast anodes. Illustrates shapes and sizes available. Talco Metal Products, Inc., 190 Berks St., Philadelphia 22, Pa.

56. Filter-Pump Selection Guide
Bulletin M-1. Eight pages. Lists many electroplating and industrial solutions and the filter pumps recommended for each. Data and facts about components and materials of construction. Illustrations and specifications for 20 representative models, ranging in capacity from 50 to 2700 g.p.h. Sethco Manufacturing Corp., 2292 Babylon Turnpike, Merrick, New York.

57. All-Purpose Liquid Cleaner
Description of a multi-purpose liquid compound that can be used for almost any industrial cleaning job. Called Turco Plaudit. Turco Products, Inc., 24600 S. Main St., Wilmington, Calif.

58. Periodic Reverse for Alkaline Descaling
Data sheet on the application of periodic reverse to alkaline derusting and descaling. Unit Process Assemblies, Inc., 61 E. Fourth St., New York 3, N. Y.

59. Cleaning Products for the Aircraft Industry
Six pages. Data on a complete line of products for aircraft manufacture and maintenance. Cleaners, spray booth compounds, carbon removers, paint removers, government specification products. Wyandotte Chemicals Corp., Wyandotte, Michigan.

60. Barrel Finishing Booklet
Booklet describes barrel finishing equipment, materials, how to use them. Abbott Ball Co., 14 Railroad Ave., Hartford 10, Conn.

61. Coated Abrasives
Information on the company's line of coated abrasive products: belts, rolls, sheets, discs, specialties. Abrasive Products, Inc., South Braintree 85, Mass.

62. Clear Semi-Gloss Lacquer
Information on Agateen No. 2B semi-gloss lacquer. Agate Lacquer Mfg. Co., Inc., 11-13 43rd Rd., Long Island City, New York.

63. Cold Stripper
Technical sheets describe Electro Cold Stripper, a non-flammable liquid paint remover that will strip air-dry and high-bake synthetic coatings, alkyds, epoxies, vinyls, phenolics and so on. This product is useful in removing specialized coatings such as photo resists, vacuum plated coatings, and is also used in conjunction with ultrasonic cleaning operations. Available in liquid form for dipping operations or in viscous form for brush application or flow on. Allied Finishing Specialties Co., 2643 W. Grand Ave., Chicago 12, Ill.

64. Clear Protective Coating
Data sheet on Irilac No. 1000, a clear, water-soluble protective coating that provides corrosion resistance and resistance to fingerprinting and abrasion without changing the appearance of the metal. For use on bare metal, conversion coated surfaces, electroplated finishes. Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Maryland.

65. Phosphate Coating for Steel
Four-page brochure describes various phosphate coatings on steel, which bond the paint and protect the metal from underfilm corrosion. Amchem Products, Inc., Ambler 29, Pa.

66. PVC Tank Lining
A six-page brochure. Amer-Plate industrial lining, a dense, flexible polyvinyl chloride sheet for lining plating, pickling and other tanks and vessels. Protects steel and concrete from strong solutions. Two types available: one for existing installations, one for new work. Amercoat Corporation, 4809 Firestone Blvd., South Gate, Calif.

67. Plating Racks
Illustrated bulletin on Thinker Boy plating racks, which are made of stock insulated parts that assemble with a leakproof seal. Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Ill.

68. Die Cast and Aluminum Cleaners
Technical data on Benchmark die cast and aluminum cleaners, completely soluble, odorless, non-toxic, non-flammable chemicals which are said to remove buffing compounds and other soils in a minimum time. Benchmark, Inc., 1060 Arch St., Wyandotte, Mich.

69. Corrosion-Resistant Coatings
Booklet entitled "What Every Maintenance Man Should Know About Urethane Coatings" describes characteristics of these plastic coatings: resistance to corrosive chemicals and fumes; resistance to abrasion, heat, sunlight, weather. Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5, N. J.

70. Stable Degreasing Solvent
Information on Blacosolv trichlorethylene degreasing solvent, which incorporates entirely new stabilizers that prevent breakdown and acid formation. G. S. Blakeslee & Co., 1844 S. Laramie, Chicago 50, Ill.

71. Copper Anodes
Publication CA-10R2. Eight pages on OFHC copper anodes. Description of advantages (bagging eliminated, less undercutting of small grains, less sludge, low porosity, uniform dissolution, top anode efficiency). Amco Div., American Metal Climax, Inc., 61 Broadway, New York 6, N. Y.

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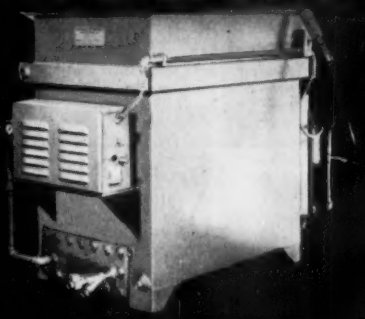

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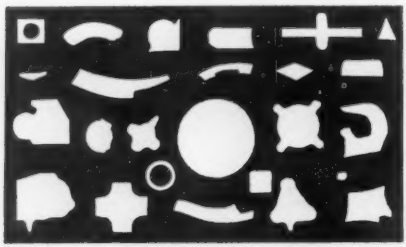
72. Tack Cloth
Literature on treated cloths that pick up dust and lint prior to paint finishing. Bond Chemical Products Co., 2639 N. Clybourn Ave., Chicago 14, Ill.

73. Pressure-Sensitive Tape Dispenser
Bulletin No. 525 tells about the Brady Tapematic, an electrically operated machine that will dispense masking tape, labels, pre-cut masks, automatically. W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 9, Wisconsin.

74. Plating Rectifiers
Information on stock and custom-built germanium, silicon and selenium rectifiers. Cadillac Rectifier Div., R-E-P Electric Products, Inc., 571 Webster Ave., New Rochelle, N. Y.



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75. Conveyor Planning Folder
Illustrated catalog includes explanatory diagrams, plant and conveyor planning grid, sheets for preliminary layouts. Chainveyor Corporation, 5618 E. Washington Blvd., Los Angeles, Calif.

76. Buffs
Data sheet describes Buff Type No. 20-RD, a heavy-duty buff made of sisal twine, used for finishing stainless steel, brass and other metals. Geo. R. Churchill Co., Inc., Dept. PF, Hingham, Mass.

77. Cleaning and Finishing Machinery
A two-page bulletin describes machines, systems and processes for cleaning and finishing metal products. Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

78. Finishing Continuous Coil Stock
Information on Clair Model 209 surface finishing machine, designed to be used in finishing coil stock and long sheets. Clair Manufacturing Co., Inc., Olean, New York.

79. Rhodium Plating Instructions
Handy pocket-sized booklet gives complete instructions for rhodium plating, includes data on solution preparation, work preparation, temperatures and current densities, tanks, anodes, and so on. Sigmund Cohn Mfg. Co., Inc., 121 S. Columbus Ave., Mount Vernon, N. Y.

80. Metallizing Material
Staples made of extremely pure aluminum and prepared for use in vacuum metallizing are described in literature available from D & W Tool & Findings, Inc., 52 Salem St., Providence 7, R. I.

81. Selection of Chromate Coatings
Fact sheet serves as an aid to the quick selection of chromate sealing and bright-

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ening finishes for non-ferrous metals. Printed on the back and front of Fact Sheet F-2 are the directions for use of the proper Kenvert coating to obtain the finish desired. Conversion Chemical Corp., 99 E. Main St., Rockville, Conn.

82. Aluminum Etchant
Technical data sheet on Cowles AK tells how this formulation works on all aluminum alloys, prevents build-up of scale by means of a special sequestering agent. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

83. Bronze Powders
Color card shows 33 colors of bronze-like finishes that can be produced from stock Cres-Lite bronze powders. Crescent Bronze Powder Co., 118 W. Illinois St., Chicago 10, Ill.

84. Water-White Lacquer
Information on Daconite 5600 clear lacquer, a ready-to-spray lacquer that is said to have excellent paleness and color retention. James B. Day & Co., 1872 Clybourn Ave., Chicago 14, Ill.

85. Nozzles for Power Spray Washers
Bulletin 100 tells how to get up to five times more nozzle life in power spray washers, how to get better finishes, which nozzle to use for each job, how to clean nozzles for better jobs. Delavan Mfg. Co., West Des Moines, Iowa.

86. Vacuum Plating
Information on depositing metallic coatings by the vacuum plating method. Consolidated Vacuum Corporation, Rochester 3, N. Y.

87. Degreasers
A four-page folder on VS-800 Series vapor-spray degreasers describes a line of open-top degreasers. Lists important features, includes diagrams to show working parts. Detrex Chemical Industries, Inc., Box 501, Detroit 32, Mich.

88. Vapor Degreasing
"Vapor Degreasing with Diamond Perchlorethylene" is the title of a 12-page technical bulletin that presents data on 13 major advantages of vapor degreasing prior to painting, plating and other finishing operations. Includes sections on essentials of vapor degreasing equipment, methods of scheduling vapor-degreaser cleanouts and solvent distillation. Diamond Alkali Co., Chlorinated Products Div., 300 Union Commerce Bldg. Cleveland 14, Ohio.

89. Electrostatic-Spray Conveyor
Details about the Econ-O-Veyor overhead conveyor, which is said to be particularly suitable for installations where paint is applied by electrostatic spray. Econ-O-Veyor, 224 Glen Cove Ave., Glen Cove, N. Y.

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90. Cleaner-Phosphatizer
A four-page folder on Divobond, a material that cleans and phosphatizes in one operation, produces no scale. Diversey Corporation, 1820 Roscoe St., Chicago 13, Illinois.

91. Latex Finishes
Bulletin tells about Dow Latex 566 for baked industrial finishes on metal. Includes information on film properties, applications, film formation, other data on this polymer that is useful in formulating water-dispersed industrial paints. Dow Chemical Co., Midland, Mich.

92. Electropolishing Stainless Steel
Literature on baths for electropolishing stainless steel includes operating instructions for two of these baths. Electro-Glo Co., 621 S. Kolmar Ave., Chicago 24, Ill.

93. Ready-Mixed Gold
Information on Sea-Lac ready-mixed gold finishes for application by spray or dip. Duralac Chemical Corp., 84 Lister Ave., Newark, N. J.

94. Paint Stripper
Technical Bulletin on Dytex No. 153 Stripper. 4 pages. Description, list of finishes removed, instructions for use. Dytex Chemical Co., 140 India St., Providence 3, R. I.

95. Metal Strippers
Enstrip Selection Chart gives complete information about solutions that will remove deposits of nickel, copper, brass, silver, zinc and cadmium plate without attacking steel basis metal. Also includes data on products for stripping nickel and copper from brass; solder, tin and lead from steel and copper-base alloys; copper, nickel and chromium from zinc-base die castings; and others. Enthone, Inc., Subsidiary of American Smelting and Refining Co., 442 Elm St., New Haven, Conn.

96. Face Mask
Information on the Flex-A-Prene face mask, which protects the wearer against overspray when spraying paint. Flexo Products, Inc., 24864 Detroit Rd., Westlake, Ohio.

97. Sisal Buffs
Descriptive literature on Zippo Sisal Buffs, which are said to be excellent as dual-purpose (polishing and buffing) wheels. Formax Mfg. Corp., Detroit 7, Mich.

98. Tumbling Media
Information on preformed tumbling media and abrasive products. Over 200 sizes and bonds available. Fortune Industries, Inc., 11770 Dexter Rd., Chelsea, Mich.

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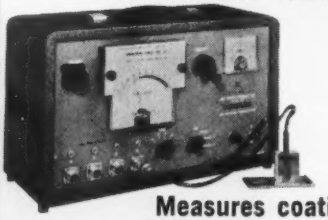

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99. Painting Machine
Information on the new Gasway Kinetic Kurtain Coater. Gasway Corporation, 6463 N. Ravenswood Ave., Chicago 26, Illinois.

100. High-Temperature Ovens
Data sheet shows several models of thermostatically controlled high-temperature ovens that are suitable for such operations as stress relief of springs and plated parts. Grieve-Hendry Co., Inc., 1341 N. Elston Ave., Chicago 22, Ill.

101. Belt Grinder
Bulletin 336-T describes and illustrates Model UBG-50 universal belt grinder, a machine with two heads—one for internal and flexible-belt grinding, one for contact wheel, flexible-belt, platen and contour-wheel grinding. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

102. Chemical Deburring Agent for Zinc Die Castings
Data sheet on Chemburr 3 and Chemburr 5, combinations of strong acids developed especially for chemically deburring and polishing zinc die castings. Heatbath Corporation, Box 78, Springfield, Mass.

103. Centrifugal Deburring and Polishing Machine
Information on the Harperizer, a new machine for quickly producing fine, smooth finishes on parts by processing in loose abrasives without fixtures. Harper Buffing Machine Co., East Hampton, Conn.

104. Used Polishing Equipment
Information on used buffing and polishing machines. J. Holland & Sons, Inc., 477 Keap St., Brooklyn 11, N. Y.

105. Filtration for the Plating Industry
Bulletin EP-100. 15 pages. Photos of and information on typical installations; construction details for various solution filters; operating cycles; information on recovery systems. Industrial Filter & Pump Mfg. Co. 5904 Ogden Ave., Cicero 50, Illinois.

106. Aluminum Etchant
Product bulletin on Alsite CX, a powdered additive which is added to caustic soda so as to make an aluminum etchant. Kelite Corporation, 81 Industrial Rd., Berkeley Heights, N. J.

107. Baking and Drying Equipment
Catalog No. 560 describes and illustrates various types of baking and drying equipment. The Lanly Co., 2800 Euclid Ave., Cleveland 15, Ohio.

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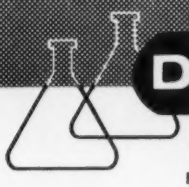

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108. Pressure Curtain Coater
Data File SIF-7 contains complete data on the Steinemann-Koch pressure curtain coater, which applies a uniform coating of lacquer or synthetic material on flat or moderately curved work. Patented Swiss process in which a vertical film is poured onto the work from adjustable orifices. George Koch Sons, Inc., Evansville 4, Indiana.

109. Multiple-Process-Cycle Plating Machine
Information on the Select-O-Matic automatic plating machine, which allows the operator to select any one of several plating cycles when he loads the machine, merely by turning a dial. Lasalco, Inc., 2820 LaSalle St., St. Louis 4, Mo.

110. Complete Finishing Systems
Catalog No. A-658. Complete finishing systems for paint, lacquer, japans, porcelain enamels, etc.; metal-cleaning and pickling equipment; dry-off ovens and cooling tunnels; spray booths; flow and dip coaters; air-supply systems; baking ovens; other equipment. R. C. Mahon Co., Detroit 34, Mich.

111. Clear Protection
Information on 2105 Clear Lacquer for the protection of brass, silver, bronze and copper. G. J. Nikolas & Co., Inc., 2880 Washington Blvd., Bellwood, Ill.

112. Finishing Systems
Bulletin shows typical integrated complete systems for applying organic coatings. Includes description of products being coated, the process used and specifications for the system. Michigan Oven Co., 431 Brainard Ave., Detroit 1, Mich.

113. Nylon Web Finishing Material
Information on "Scotch-Brite" finishing material, which is made by impregnating a tough nylon web with microscopic working particles. Scotch-Brite sections can be mounted on lathes, used on conveyorized machines, mounted on flexible shaft, or used as a pad, for hand work. The manufacturer recommends this product for use in metal blending, cleaning, finishing, and for correction of surface imperfections. Gives a consistent finish from beginning to end of a run. Minnesota Mining and Manufacturing Co., Dept. FH-59, 900 Bush Ave., St. Paul 6, Minnesota.

114. Bonderites for Aluminum
A four-page folder on Bonderite coatings for aluminum describes Golden Bonderite and Green Bonderite, has data on methods of application, salt-spray tests. Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11, Mich.

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115. Orbital Sander
Catalog describes and illustrates the Mity-Midget, an orbital sander that weighs only four pounds, yet cannot be stalled even by standing on it. National-Detroit, Inc., Rockford, Ill.

116. Copper and Nickel Sulfate
Information on Triangle Brand copper and nickel sulfates, for use as sources of copper and nickel in plating. Phelps Dodge Refining Corp., 300 Park Ave., New York 22, N. Y.

117. Setting Up Polishing Wheels and Belts
Form 1340, a 45-page booklet on methods of setting up polishing wheels and belts for metal finishing operations, includes detailed instructions on abrasive grains, glue and its preparation, types of polishing wheels and their fields of use, correct drying of polishing wheels, handling and storage, other related subjects. Norton Co., Worcester 6, Mass.

118. Thermosetting Acrylic Enamel
Brochure contains information on Duracron thermosetting acrylic enamel, tells how this coating can reduce manufacturing costs. Pittsburgh Plate Glass Co., Industrial Finishes Div., 1 Gateway Center, Pittsburgh, Pa.

119. Degreasers
Information and engineering assistance on vapor degreasers, equipment. Progressive Chemical & Equipment Corp., 12068 Woodbine Ave., Detroit 39, Mich.

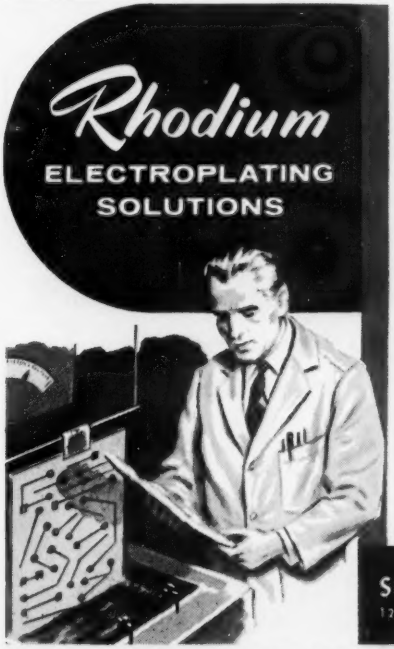
120. Vapor Degreasing Handbook
A 22-page booklet answers 45 questions commonly asked about vapor degreasing. Phillips Manufacturing Co., 3457 W. Touhy Ave., Chicago 45, Ill.

121. Nickel Plating Salts
Information on company's line of "Quality Certified" nickel plating salts. Nuodex Products Co., Elizabeth, N. J.

122. Automatic Polishing
Information on automatic polishing and buffing machines. Packer Machine Co., Meriden, Conn.

123. Black Oxide
Bulletin H-16 tells how to produce a rust-resistant black finish that is also an excellent base for topcoats of lacquer or enamel. Park Chemical Co., 8074 Military Ave., Detroit 4, Mich.

124. Pearlescent Paints
Information on air-dry and baking-type pearlescent finishes. Rona Laboratories, Inc., E. 21st and E. 22nd St., Bayonne, New Jersey.



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125. Coatings for Steel
Information on the company's line of organic coatings for steel. These products are said to offer greater resistance to temperature, excellent color control, greater tensile strength. Reynolds Chemical Products Co., Whitmore Lake, Mich.

126. Protects Finished Parts
Folder on Neotex protective mesh, which can be used to line trays, baskets, tables, benches—any surface where highly polished or critical-tolerance parts are being worked on or are in transit. Research Products Corporation, Madison 1, Wis.

127. Barrel Finishing Machines
New catalog illustrates and gives complete details on all Rampe's barrel finishing machines, including 30 X 32, Rampe's newest, heavy-duty machine. Rampe Mfg. Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

128. Vibrating Abrasive Finisher
Four-page folder on the Vibratron, a machine which vibrates a load of parts and abrasives to deburr, clean and polish the parts. Typical applications, description of operation and mechanism, design features. Roto-Finish Co., 3730 Milham Rd., Kalamazoo, Mich.

129. Barrel Nickel
Technical information, process details, equipment required, trouble-shooting tips for Sey-Lite bright nickel used in barrel nickel plating. Seymour Manufacturing Co., Seymour, Conn.

130. Chromium Chemicals
Bulletin 52 contains technical information on chromic acid and other products. Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

131. Soak Cleaner
Information on a controlled-pH, high-detergency soak cleaner for applications where space is limited for precleaning. Solventol Chemical Products, Inc., 15841 Second Blvd., Detroit 3, Mich.

132. Complete Finishing Systems
Literature on Spra-Con complete finishing systems for applying organic coatings. Data on components such as washers, ovens, flow-coat machines, conveyors, air make-up systems. The Spra-Con Co., 3600 Elston Ave., Chicago 18, Ill.

133. Spraying Wash Primer
Information on Stantite Spraying Wash Primer, a two-package rust-inhibiting primer that is said to improve the quality of any topcoat, air-dry or bake. Stanley Chemical Co., Dept. PF, 1338 Berlin St., East Berlin, Conn.

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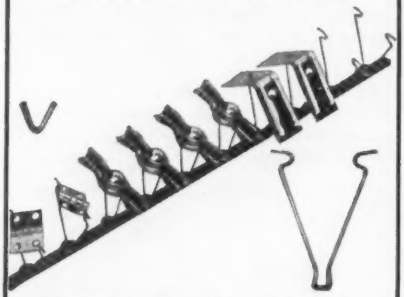

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134. Spray Nozzle Catalog
Catalog No. 24 is a 48-page booklet containing complete data on various spray nozzles and accessories. Nozzles are listed in tabular form and complete information is given on pipe sizes, external dimensions, orifice diameters, capacities and spray angles. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

135. Liquid Buffing and Coloring Compositions
Four pages on liquid buffing compounds. Detailed information on 11 special liquid buffing and coloring compositions. Frederic B. Stevens, Inc., 1800 Eighteenth St., Detroit 16, Mich.

136. Air Sanders
Data on portable air-operated sanding machines. Sundstrand Machine Tool Div. of Sundstrand Corp., 2531 Eleventh St., Belvidere, Ill.

137. Vacuum Metallizing Coils
New catalog lists 164 sizes and shapes of vacuum metallizing coils, tells about typical applications for each of them. Sylvania Electric Products, Inc., Chemical & Metallurgical Div., Towanda, Pa.

138. Brass Plating Solution
Technical bulletin on True Brite brass solution, which is available in a variety of colors. True Brite Chemical Products Co., Box 31, Oakville, Conn.

139. Barrel Plating Equipment
A 12-page bulletin on the Udylite line of barrel plating equipment describes plastic cylinders, cluster barrels, multiple-barrel units, complete barrel plating systems, storage and transfer units, dryers, final rinse units, other related equipment. Udylite Corp., Detroit 11, Mich.

140. Copper Anodes
Information on "Phosphor-Brite" rolled copper anodes for acid copper plating baths. Univertical Corp., 14841 Meyers Rd., Detroit 27, Mich.

141. Acrylic Coatings
Performance and application information on acrylic-based coatings. The Varnish Products Co., 5204 Harvard Ave., Cleveland, Ohio.

142. Baking and Drying Ovens
Bulletin 157 describes line of batch and conveyor-type baking ovens for heating up to 1,000 deg. F. Young Brothers Co., 1830 Columbus Rd., Cleveland 13, Ohio.

143. Etch Primer
Data on Gripalloy, an etch primer available in black and colors. Used as primer or finish coat. Tenax, Newark 5, N. J.

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SHORT OF STEEL? Don't discard steel parts because of paint defects!

Enamels, even *high bake*, vinyls, epons, hammers, wrinkles, alkyd paints, primers —in fact—every known hard to remove finish yields to ELECTRO COLD STRIPPER in quick time — often seconds. Eliminate the problem of paint build-up on conveyor baskets, carrying racks, hooks, etc., with an ELECTRO COLD STRIPPER in-line or batch set-up.

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CHEMIST

SITUATION OPEN—Chemist for Plating Laboratory in large finishing Company, Newark, New Jersey. Experience in analysis and control. Reply submitting full resume of experience to Box No. 122, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

PLATING FOREMAN

Situation open for experienced man to operate Plating Department of Central Indiana Plant. Must have production and operational knowledge of Nickel, Chrome, Brass and Zinc Plating.
Write Box Number 128, c/o Products Finishing, 431 Main Street, Cincinnati, Ohio.

MANUFACTURER'S REPRESENTATIVES

wanted in Eastern and Midwestern territories who know metal cleaning and paint stripping to sell unusually effective line of specialities. These are performance proven, not just run-of-mill. Applicants must have experience and good contacts to secure quick action. **Write ESBEC Chemical Division, Box 929, Stamford, Conn.**

FOR SALE — Plating — Anodizing Equipment—Used Only Six Months. Eleven Mild Steel Tanks 6'6" long x 20" wide & 3' deep Ventilating System—4800 CFM Gas Heating Equipment, 500 lb. Hoist with 50' 6" "I" Beam—Air Agitation Blower All Component Parts; Piping — Controls — Spray Manifolds & Valves—Electrical Wiring, etc., Included. Priced Low for Quick Sale — Located in North Central U. S. **Box No. 125, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.**

EQUIPMENT ENGINEER — Leading supplier of plating equipment desires experienced engineer to prepare specifications and quotations for customers. Salary open. Connecticut location. Our employees know of this ad. Write Box No. 124, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

HELP WANTED

Chemists or Chemical Engineers—Illinois manufacturer with extensive metal finishing operations has several job openings for men under 40 in both technical and supervisory classifications. Fine opportunities with progressive company in an ideal family community. Send complete resume and picture. Box No. 127, c/o Products Finishing, 431 Main St. Cincinnati 2, Ohio.

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New England State

Must have complete knowledge of all phases of finishing, cleaning, plating, enameling, buffing; must be capable of assuming both technical and administrative responsibilities of finishing plant; direct program of development of new finishes and new finishing techniques. Write Box No. 129, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

Paints Wanted By Manufacturer's Representatives Buffalo and Western N. Y. Products Finishes (enamels and lacquers), Painter Products—Write Box No. 123 c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

SALES REPRESENTATIVES WANTED

Leading manufacturer is seeking representation in several territories now open for selling Metal Parts Cleaning and Processing Equipment. Straight commission. Execllent opportunity for aggressive man or strong company experienced in the Metal Finishing field. Engineering background and knowledge of chemical cleaning compounds preferred. Give complete details including full data on your organization and principals, experience and territories now covered. Write Box No. 126, c/o Products Finishing, 431 Main St., Cincinnati, Ohio.

SALES ENGINEER

Electroplating background to handle process and equipment sales and service for Midwestern territory. Emphasis on precious metals and military specification work. Willing to relocate. State experience and salary requirements. Box No. 121, c/o PRODUCTS FINISHING, 431 Main Street, Cincinnati 2, Ohio.

Space on this page is available for advertising of Services, Employment, Used Machinery & Equipment, Etc.

Sold in inch units, one col. wide.
Rate: $22 per col-inch.

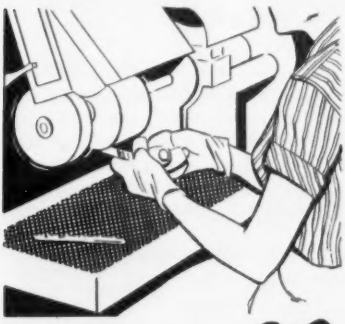
PRODUCTS FINISHING,
431 Main St., Cincinnati 2, Ohio

Movie on a Protective Coating for Exterior Aluminum. A color motion picture entitled "Half-Second Butyrate—A Protective Coating for Exterior Aluminum Surfaces" is available for showing from Eastman Chemical Products, Inc., 260 Madison Ave., New York 16, N. Y.

"Preserving the clear, clean finish that makes aluminum buildings so attractive and distinctive presents a problem of increasing importance. For while aluminum will withstand weathering without suffering any structural damage, its surface does deteriorate." In these opening lines Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, sets the stage for its new 16 mm. full-color motion picture.

For fifteen minutes the film discusses the laboratory and field tests made to determine the effectiveness of Half-Second Butyrate coatings. It also describes in complete detail how the exterior aluminum surface of a large industrial plant built in 1953 was recently restored and protected against further deterioration with this weather-resistant lacquer.

PROTECT FINE PLATED SURFACES



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Neotex . . . the open pattern Neoprene rubber matting, protects highly polished finishes when used to line any surface where goods are worked on or in transit. In roll form, Neotex can be easily cut to any size or shape . . . it's rugged and long lasting, resistant to abrasives, caustics, heat, acids, oils, oxidation. Open pattern permits buffing compounds to settle. Available in a fine or coarse pattern. Write for complete information.

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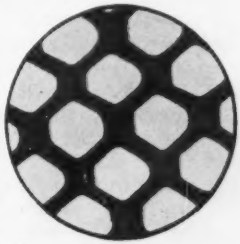

RESEARCH PRODUCTS CORPORATION
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News of the Finishing Industry

- company news
- new positions
- new plants
- meetings

NEW PLANTS

Solvay Opens West Coast Sales Office

Solvay Process Division of Allied Chemical Corporation has opened a new West Coast Sales Branch. John W. Priesing has been appointed manager of this branch.

Stevens Opens New Warehouse and Office in Indianapolis

Official opening of a new warehouse and office for Frederic B. Stevens, Inc., took place at a recent two-day open house for local businessmen in the foundry and metal finishing industries.

The new location for all Stevens facilities in Indianapolis is at 5345 Lexington Avenue, moved from 4000 East 16th Street.

Personnel at the new location will remain the same, with Vincent Bruce and Gene Conreaux representing the Stevens Foundry Department and Roman Bender representing the Stevens Metal Finishing Department.

Sel-Rex Establishes New West Coast Office

Sel-Rex Corporation, with executive offices in Nutley, New Jersey, has established a new West Coast office at 2180 Colorado Ave., in Santa Monica, Calif., a suburb of Los Angeles. The new office provides facilities for additional personnel and warehousing of precious metals processes and equipment.

Walter Walczyk

Walter H. Walczyk, formerly chief chemical engineer, Remington-Rand Univac (engineering development section) who was recently appointed Sel-Rex west coast representative, has been assigned the additional responsibility of heading all Sel-Rex sales and service activities in the area.

New Facilities for V. J. Dolan

V. J. Dolan and Co., Inc., Chicago manufacturer of industrial finishes, is building a new plant on company property at 1825 N. Latrobe. The new facilities, which double present capacity, will be used for manufacture of stains, fillers and "Spex" (multicolor).

Harbison-Walker and Carborundum Form New Corporation

Formation of Harbison-Carborundum Corporation by Harbison-Walker Refractories Company, Pittsburgh, Pennsylvania and The Carborundum Company of Niagara Falls, New York has been announced by E. A. Garber, president of Harbison-Walker, and General Clinton F. Robinson, Carborundum's president. Harbison-Walker, world's

largest refractories manufacturer, and Carborundum, a principal factor in the abrasives market and a leader in the manufacture of super refractories, will pool their advanced refractories technology and sufficient financial resources to establish a jointly owned subsidiary for the engineering, manufacture and sale of fused refractories.

Atlas Powder Dedicates New Darco Lab

Atlas Powder Company recently dedicated its new Darco Experimental Laboratory in Marshall, Texas.

Atlas president Ralph K. Gottshall said the new laboratory represents a major step forward in Atlas' planned growth through research.

"We are confident," he said, "that there will be developed within the walls of this building the new products and processes that will be contributing to Atlas' vigorous growth five to ten years from now. We believe, too, that the research done here will help broaden our base, and, consequently, we can better withstand the inevitable economic dips that face us in the future. It is evidence of our faith in research and its importance to the future of the company."

Activated carbons are used to decolorize, deodorize, and otherwise purify almost any type of liquid or solution; their uses range from sugar refining to drycleaning, from water purification to white sidewall tire manufacture. The modernization program at the Marshall Plant and the laboratory has cost more than $5,500,000 in the past few years. Willem J. vanReenen is manager of the plant;

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- Dust Collecting Systems
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- Filters
- Furnaces and Ovens
- Generators
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- Rheostats and Controls
- Rectifiers: Selenium, Germanium, Silicon-Type
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Members of Parker Rust Proof Company's sales team huddled for this picture during recent annual meeting and 45th anniversary celebration. Members of the first string are (back row, left to right) Ross Perry, manager, Cold Forming Division, Earl Stone, manager, Eastern Regional Office, Clint Rasmussen, assistant service manager, Leo Bales, manager, Midwest Regional Office, Ed Thompson, general sales manager, Frank Hendricks, sales promotion manager, Max Roosa, executive vice president, Carl Moore, manager, South Western Regional Office, Bob Greene, assistant sales manager. Front row (left to right) Barry Dittmore, manager, South Central Regional Office, Van Darsey, vice president, Mel Crandell, assistant manager, Eastern Region, Russ Peterson, service manager, Sam Headlee, manager, Pacific Coast, Harold McVey, manager, New Products.

R. B. Hoots, Jr., is manager of the laboratory, which is a unit of Atlas' Chemical Engineering Department.

COMPANIES

Parker Rust Proof Celebrates 45th Year

Parker Rust Proof Company recently celebrated its 45th anniversary.

Highlight of the Parker anniversary was the company's annual sales meeting and seminar for approximately 100 Parker representatives at the firm's general offices in Detroit.

Parker Rust Proof and its processes were born in the kitchen of Clark W. Parker, company founder. First batches of the initial product were brewed on the kitchen stove and the first "mass production" facilities were

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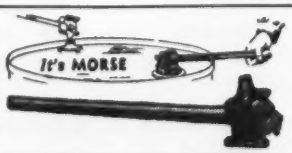
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED..... $4.10
Non-sparking type.....$6.30
Plus Parcel Post
MORSE MFG. CO., Inc.
762 W. Manlius St., E. Syracuse, N.Y.

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in the basement of the Parker home.

From these first products and experiments came the famous Parkerizing process out of which developed the more than 350 products in the line today, used throughout the automotive and other metal working plants for protective coatings.

Today, Parker Rust Proof, a Canadian subsidiary, and the Tropical Paint Company, another subsidiary, have an annual sales volume of over $12,000,000 and manufacture a total of 467 separate items. The company holds over 200 U. S. and 100 Canadian patents.

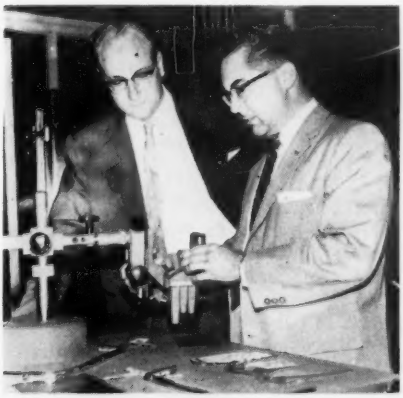
Australian Electroplating Shows Rapid Growth, Says Visitor

The rate of growth of electroplating "down under" is out-pacing the United States, according to Peter L. Berkelaar, technical sales representative, United Chromium (Aust.) Pty., Ltd., Sydney, who is spending a month in this country being brought up to date on the latest technical developments in both electroplating and organic coatings. Mr. Berkelaar estimates that Australian electroplating activity has more than doubled since World War II, and should double again within the next ten years.

He has been a guest of Metal & Thermit Corporation's electrochemical division in Detroit, where he has been learning about Duplex Chromium —the new process developed by M&T for achieving thicker, more corrosion-resistant chromium plate. The process was explained by R. W. Couch, research manager of the electrochemical division.

Illustrating the interest with which Australian metalworkers view new developments, Mr. Berkelaar pointed out that SRHS (self-regulating, high-speed) chromium plating baths were introduced in Sydney in 1956. They are now used in 60 to 65 per cent of all commercial plating baths.

Australian plating practices are practically identical to those in the United States, Mr. Berkelaar pointed



Peter Berkelaar (left) technical sales representative, United Chromium (Aust.) Pty., Ltd., Sydney, Australia, and R. W. Couch, Metal & Thermit Corporation. (Photograph courtesy Metal & Thermit Corporation, Rahway N. J.).

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GET THE BEST!

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QUALITY
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Enthone sales representatives during recent sales meeting. (Seated, l. to r.) J. H. Shockcor; T. Brewer, L. H. Butcher Co.; L. J. Durney; C. C. Helmle, vice president and general manager; R. B. Goodsell; A. H. Sanders; D. S. Hartshorn; L. V. Gagnon. (Standing, l. to r.) W. K. Murray; H. M. Goldman; F. A. Schneiders; D. F. Seymour, L. H. Butcher Co.; A. R. Tefft; A. J. Kolb; E. B. Washburn; A. F. Fletcher; J. E. Rhoads; Dr. E. B. Saubestre; M. R. Herman, vice president; J. J. Martin; J. R. Eisele. Absent when photo was taken: Dr. Walter R. Meyer, president of Enthone, a subsidiary of American Smelting and Refining Co.

out. He attributes this to the excellent transmission of technical and application information from this country. The main difference is that production runs "down under" are far smaller than in the U.S., meaning less automation of plating equipment.

Enthone Holds Sales Meeting

Enthone, Inc., New Haven, Conn., subsidiary of American Smelting and Refining Co., recently held its Fall sales meeting at the New Haven Motor Inn. The Enthone sales slogan for 1960, "Make Sales Soar in '60," was introduced and each sales engineer was presented with a chrome plated letter opener engraved with the slogan. Sales and technical aspects of the new products of Enthonics developed during the past year were discussed at length.

The four-day sales meeting was co-chairmanned by W. K. Murray, manager of marketing, and A. Harry Sanders, New England sales manager.

"GRIPALLOY"

. . . Attractive satin sheen ETCHING PRIMER in black and colors . . . Often used as finish coat . . . Air dries in minutes . . .
. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer.
. . . Excellent resistance to Salt Spray, Gasoline, and Solvents . . .

TENAX, Newark, N. J.
Lacquers—Enamels
Synthetics—Vinyls

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Detro To Sell Direct

Detro Mfg. & Sales Co., Inc. Culver City, California, manufacturer of Detroit Handy "Tac" Rags, has announced that effective immediately, Detro will serve accounts directly from its main offices in Culver City.

Consulting Engineering Service

The Consulting Engineering Division of Djordjevic Engineering Company, Chicago, Ill., is equipped to offer consulting engineering services in the

following areas: research, development and design of new products; improving old products; diversification and expansion of product lines; undertaking long-range scientific problems; production of prototypes and samples.

Djordjevic's facilities are representative of various sciences, and thus the company is equipped to undertake research, development and design assignments in many fields. Further information about the company's services can be obtained by writing to Consulting Engineering Division, Djordjevic Engineering Co., 1933 N. Damen, Chicago 47, Ill.

Schaffner Franchises Minnesota Firm

George A. Cushman

Schaffner Manufacturing Company has issued a franchise to George A. Cushman, president of Sterling Machine and Supply Co., Minneapolis, Minn. Mr. Cushman's sales organization will distribute Schaffner products in Minnesota, Iowa, North and South Dakota and western Wisconsin.

Chromium Plating Pioneer Retires

J. Merle Hosdowich recently retired after 35 years' service with Metal & Thermit Corporation.

Mr. Hosdowich joined the company in 1923 to do research and development work on chromium plating. Prior to this, he was a research Fellow at Mellon Institute in Pittsburgh. He received a B.S. in Mechanical Engineering from Carnegie Institute of Technology.

In the late 1920's, Mr. Hosdowich became chief chemist and laboratory manager of United Chromium Corporation, now an M & T subsidiary. Since 1940, he has served in various technical and advisory capacities with Metal &

J. Merle Hosdowich (left), chromium plating pioneer, retired from Metal & Thermit Corporation after 35 years' service. H. D. McLeese is shown presenting electric portable typewriter to commemorate occasion.

13

YEARS OF ANODIZING AND ELECTROPOLISHING RACK MAKING MARK US AS SPECIALISTS IN THE INDUSTRY!

Leading metal fabricators attest to our pioneering leadership and the superior quality of our ALL TITANIUM racks!

Inquire about our standard or custom engineered racks!

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Chicago 7, Ill.

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Formerly Service Screw Products Company

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Thermit Corporation in New York and Rahway.

The author of numerous technical papers and articles on chromium plating, Mr. Hosdowich also has been a frequent speaker before professional and technical societies.

Pressure Blast Appoints New Representatives

Five sales organizations have been appointed to represent the Pressure Blast Mfg. Co., Inc. in the sale of that company's line of blast finishing equipment: Beesley-Hoffman Machinery Co., Buffalo, N. Y. (central and western New York); H. E. Hofferberth Machinery Co., Dayton, Ohio (central and southern Ohio, northern Kentucky and eastern Indiana); Riordan Machinery Co., Detroit, Michigan (eastern Michigan); Stanley Supply Co., Cleveland, Ohio (northern Ohio); Lee Hornmeyer Co., St. Louis (Missouri, eastern Missouri, southern Illinois); Industrial Sales Service, Inc., Dallas, Texas (Texas, Oklahoma, Arkansas, Louisiana, western Missouri).

Diamond Alkali Announces Aid-to-Education Program

The Diamond Alkali Foundation announced today the establishment of a new, four-fold program designed to financially assist higher education in this country. The program, which becomes effective January 1, 1960, includes direct financial grants to colleges, merit-scholarship awards, graduate fellowships, and for the first time, an employee-gift-matching plan.

A significant part of the total contribution will be allocated for the Educational Grants Program. Schools whose scientific curricula include courses beneficial to the Chemical Industry will receive the grants directly, to be administered at their discretion.

The Employee-Gift-Matching Plan is designed to encourage individual responsibility to higher education. The company will match contributions, up to $500 per year, of any regular employee to four-year degree-granting schools, technical institutes approved by the Engineer's Council for Professional Development and junior colleges whose credits are transferable to a regionally accredited four-year, degree-granting school.

Additional information concerning these programs is available by writing to Diamond Alkali Company, Public Relations Department, 300 Union Commerce Building, Cleveland 14, Ohio.

Servi-Sure Rack Division Marks Thirteen

The Service Rack Division of Servi-Sure Manufacturing Co. celebrated its thirteenth year during November. The Chicago manufacturer of anodizing racks built its first products in 1946.

Ernest Rosner

Since that time the company has developed several distinctive types of anodizing racks. One of these, the disc-type rack, is now used extensively. This type of rack will accommodate thousands of different parts and will hold a large number of parts within a small tank volume. It is instantly adjustable for new parts.

ZINC PLATERS: Purify your cyanide zinc solutions with

McKeon's **Zinc-Brite**

Regular use keeps zinc solutions clear. Brightens Work.

Write—Phone—Wire Collect for free brochure

Sulphur Products Co., Inc.

McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.

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Service Racks are now used by Frigidaire Division of General Motors, General Electric, Western Electric, Raytheon Manufacturing Co., Kinkead Industries, Chamberlain Corp., Ford Motor Co., and many government arsenals, according to Ernest Rosner, president of the company.

Udylite Celebrates Fortieth Birthday

Forty years in business were completed in November by the Udylite Corporation, Detroit. The anniversary was celebrated with the official announcement of new $600,000 facilities for manufacture of organic chemicals at its subsidiary, the Udylite Research Corporation, in Warren, Michigan, a suburb of Detroit.

Official date for the birthday, according to Clyde H. Reeme, president, is November 11. On that date in 1919 incorporation papers were signed for the Udylite Process Company. Marvin J. Udy founded the company.

The corporate name was changed to the Udylite Company in 1933, and to the Udylite Corporation in 1939, when the business became officially incorporated under its present title.

M. M. Might

Paul H. Krupp

J. R. Pigman

Jack Barber

New Infrared Oven Company Formed

Four veterans in the infrared field have formed a new company under the name of Barber Infrared Associates. The combined experience of these four men, Jack Barber, Paul H. Krupp, M. M. Might, and J. R. Pigman, totals approximately 70 years.

Jack Barber entered the infrared field in 1943. He has written and delivered many technical papers before engineering groups, and is particularly well known throughout the automotive industry.

Paul Krupp, who has been associated with the infrared business since 1941, has been engaged in the promotion and sales activities. He has written articles pertaining to infrared and its uses for many of the trade magazines.

Most of Mr. Might's activities for the past sixteen years have pertained

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- **COB MEAL (Tumbling)**

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to laboratory testing, research, application data and field service work with infrared users.

J. R. Pigman's experience in the infrared field started in 1941. He has seen the infrared oven business grow from a few portable types to large production ovens with intricate control circuits for automated manufacturing lines; and under his direction many such ovens have been developed.

Barber Infrared Associates will have headquarters in a modern plant at Bradner, Ohio, near Toledo.

The new infrared organization expects to become active in all of the various industries where infrared is applicable, including high-temperature furnaces.

Allied Completes Fall Series Of Regional Sales Meetings

Allied Research Products, Inc., Baltimore, Maryland manufacturer of chemicals, equipment and engineering services for the metal finishing industry, has completed a three-part series of Fall regional sales meetings.

The first meeting, comprising the Northeast Region under the direction of L. F. Richard, was held October 7-9 at Pocono Manor, Mt. Pocono, Pa. This was followed by a gathering of the representatives covering the Central District, under the direction of L. J. Camill, at the St. Clair Inn, St. Clair, Michigan, October 14-16. The concluding session of the series was held at Lake Lawn Lodge, Lake Delavan, Wisconsin, October 21-23. Representatives from the Midwest territory, under the direction of A. L. Poe, attended this session.

Members of the headquarters staff attending the meetings included H. C. Irvin, president, J. A. Cairns, vice president in charge of sales and F. M. Mansfield, vice president in charge of marketing.

"DEFINITELY HELPED"

"The course has definitely helped," writes Lew Briggs, well known shop owner of Erie, Pa., who up to the present has enrolled seven men, including himself, in ELECTROPLATING KNOW HOW. If plating is your business, you too will be definitely helped when you enroll in this unique home study course in modern electroplating. Write Dr. Kushner, Electroplating School, Box 2066, Station D, Evansville 14, Ind., TODAY!

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Sax of American Buff Buys J. J. Siefen Company

Ben P. Sax, chairman of the board of the American Buff Company, Chicago, has purchased J. J. Siefen Company, Detroit.

The Siefen Company makes buffing compounds and spray equipment for the metal-finishing industry. Established in 1927 by J. J. Siefen, the company will retain its identity and will continue to operate as a separate enterprise. Siefen also has offices in Chicago; Cleveland; Los Angeles; Syracuse, New York; Beloit, Wis.; Flint, Mich.; and Hamden, Conn.

Mr. Sax bought the Detroit company from Mrs. Ida Siefen Stark, widow of the founder.

Name Change for Norton-Overseas

The corporate name of Norton Behr-Manning Overseas, Inc. has been changed to Norton International, Inc., according to an announcement by A. Donald Kelso, president.

The corporation itself has not been changed in any way. It will continue to operate the firm's 16 plants in 10 countries and to handle export sales of products made by Norton Company of Worcester, Massachusetts, and its Behr-Manning Division at Troy, N. Y.

Chainveyor Appoints North Carolina Distributor

Chainveyor Corporation has appointed Mizi Co., Inc., as the exclusive distributor for Chainveyor overhead powered and power-free conveyor systems in North Carolina.

A. J. MacDermid Sells Controlling Interest in MacDermid, Incorporated

Archie J. MacDermid recently sold controlling interest in MacDermid Incorporated, Waterbury, Connecticut developer and manufacturer of metal-finishing chemicals.

Under terms of the $1,500,000 transaction, representing 31 per cent of the outstanding stock, MacDermid sold 16,240 shares to 55 employees at a price of $33.16 per share. His remaining holdings of 29,000 shares were purchased by the company at the same price. Eighty per cent of the employees now own 72 per cent of the voting stock.

At the meeting at which the transaction was approved, Harold Leever, company president, told stockholders that increased expenditures for research and development resulted in a sales record for the fiscal year to March 31, 1959, despite the recession. For the first four months of this year to July, sales exceeded last year's mark for a comparable period by 58 per cent and were 22 per cent ahead of the fiscal year level. Annual sales are between 5 and 6 million.

Mr. MacDermid resigned as board chairman and director, and will retire. In addition to Mr. Leever, other officers and directors (who remain) are Stanley S. Krentel, Detroit, executive vice president; Thomas A. Downie, vice president and secretary; Arthur R. McNeil, vice president and New England sales manager; J. Douglas Lunan, treasurer; and John A. Hawksley, general superintendent.

NEW POSITIONS

Albert C. Munn, veteran salesman for **Diamond Alkali Company** at its New York Branch Sales Office, retired in September.

Taking over Mr. Munn's sales territory is **Girard E. Pfeil,** who has been associated with the Diamond sales organization since September, 1957.

John Geyer, manager of the Product Development Department, Metalworking Chemicals Division, **Amchem Products, Inc.,** Ambler, Pa., has been promoted to technical assistant to Amchem's president, Gerald Romig.

Mr. Geyer will be succeeded in the Product Development Department by **Hugh Gehman,** who has been his assistant since January, 1955.

John Geyer

Fred I. Johnson

Fred I. Johnson joined **Young Brothers Company** as sales engineer covering Iowa, Wisconsin, northern Indiana, northern and eastern Illinois. His headquarters are in Elmhurst, Ill.

★ ★ ★

Consolidated Vacuum Corporation appointed **Howard C. Jones** as assistant to the president and **Malvern J. Gross** as director of manufacturing.

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47th A. E. S. ANNUAL CONVENTION,
Hotel Statler, Los Angeles, California
July 24-28, 1960

Carleton A. German elected to the Board of Directors of **Solventol Chemical Products, Inc.** Mr. German has been connected with Solventol since 1944 and was recently named general sales manager of all divisions.

J. Newton Perham

Carleton A. German

J. Newton Perham appointed to the sales and engineering staff of the **Precious Metals Department, General Plate Products Group, Metals & Controls Div., Texas Instruments, Inc.** Mr. Perham will work in both headquarters and field sales, serving the rhodium plating solutions market exclusively.

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MEETINGS

Detroit Branch National Officers Night, Christmas Party

The Detroit Branch of The American Electroplaters' Society will have National Officers' Night on Friday, December 4, followed by the annual Christmas Party and Dance on Saturday, December 5. Both events will be at the Statler Hotel.

National Officers' night will feature a symposium on Nickel Plating, beginning at 8:00 P.M. Technical chairman is Myron Diggin, Hanson-Van Winkle-Munning Co. Panel members include Walter L. Pinner, McGean Chemical Co., Dr. Henry Brown, Udylite Research Corporation, and Dr. M. M. Beckwith, Harshaw Chemical Co.

Los Angeles Plans for '60 A.E.S. National Convention

Los Angeles A.E.S. members are hard at work planning for the 1960 edition of the American Electroplaters' Society National Convention. The Statler Hotel will be headquarters for the first West Coast convention ever held by the A.E.S. Dates: July 24-28.

Herman J. Struckhoff

Among the events planned for the convention week are a trip to Disneyland; a trip to Hollywood for the ladies; and a complete childrens' program.

Herman Struckhoff, Laco Engineering and Sales, Inc., Los Angeles, is Convention Liaison Representative for

Fig. 1—The Inorganic session was headed by Ralph D. Wysong. (Left to right) are: Vincent Mattacotti, Milwaukee Plating Co.; Bernard C. Case, Sunbeam Corp.; Dr. Harold J. Wiesner, Bendix Aviation Co.; Craig McAlister, Bussman Mfg. Div.; Phil J. Ritzenthaler, Plating Engineering Co.; R. D. Wysong, Studebaker-Packard Corp.; J. M. Andrus, Croname, Inc.

the Metal Finishing Suppliers' Association, Inc., this year. M.F.S.A. sponsors the open house party on Monday night of every national convention. M.F.S.A. also sponsors a golf tournament. Mr. Struckhoff reports that arrangements for both events already have been made.

Midwest Finishers Hold Successful Conference

The 1st Annual Midwest Regional Conference, held by the Chicago, Milwaukee, Mississippi Valley, Rockford, St. Joe Valley, and St. Louis Branches, A. E. S., brought 230 members and

Fig. 2—(Left to right): L. L. Diveley, Cutler-Hammer, Inc., session chairman; Orville Spawn, E. I. du Pont de Nemours & Co.; Alex Andreoni, Glidden Co.; Rudy Hazucha, Clinton Co.; Lloyd Gilbert, Rock Island Arsenal, comprised panel for organic session.

Fig. 3—Speakers' table at luncheon meeting. (Left to right) are: J. D. Thomas, General Motors Research Staff; Chester G. Borlet, Grand Rapids Brass Co., A. E. S. 2nd vice president; R. D. Wysong, Studebaker-Packard Corp., A. E. S. president; Eugene Roth, Roth Plating Corp., vice president, Midwest Regional Council; Clyde Kelly, American Plating Co., an A. E. S. past president; William Geissman, National Lock Co., Regional Conference chairman; Dr. William Blum, consultant; L. L. Diveley, Cutler-Hammer, Inc., president, Midwest Regional Council; Carl Durbin, Chrysler Corp.; Paul Glab, Northwestern Plating Works, secretary-treasurer, Midwest Regional Council.

Fig. 4—Dr. William Blum: "In the years ahead, which we are calling the Space Age, the Electroplating Industry must educate itself to fill its fair share of that space."

Fig. 5—Carl Durbin, Chrysler Corp., speaking on "Experiences in Using the Corrodkote Test." Session Chairman Clyde Kelly, American Plating Co., at left.

Fig. 6—James D. Thomas, General Motors Research Staff, the second speaker of the afternoon session, discussed the CASS Test.

guests to Rockford College, Rockford, Illinois on Nov. 7. Workshop sessions were held during the morning, with questions from the floor being answered by the panel members. This procedure followed, in part, the precedent established by one session of the 1958 A. E. S. National Convention, held in Cincinnati, and by the 1959 Rockford Branch Annual Meeting. Both the Inorganic (Fig. 1) and Organic (Fig. 2) sessions were well attended.

Following lunch (Fig. 3), Dr. William Blum (Fig. 4) presented the high points of his talk "Education and the Electroplating Industry," indicating the need for inspiring teachers to instruct students in chemistry and plating principles. He urged that more popular articles on plating be published, stating that more people must be better informed about plating. He stressed the need for further development in two directions: improvement of present methods; learning new applications of plating on new metals.

The afternoon sessions of the Conference featured talks on accelerated testing methods (Figs. 5, 6). Members of participating branches prepared exhibits of plated products for display during the Conference.

The Planning Committee for this important conference included William Geissman, chairman; Si Gary, Frank Marshall, Louis Ragues, Murray Rounds, John Williams, George Parisho, Andrew Julius, Al Overbey, Vern Wissen, Harold Ellis and Leonard Weeg.

AZI Holds Symposium on Plating Die Castings

American Zinc Institute, Inc., invited 150 industry representatives to its symposium on Plating Zinc Die Castings held in the Statler-Hilton Hotel, Detroit, November 11 and 12. Guests included automotive industry plating experts, die casters and platers, representatives of plating supply companies who have participated in AZI Re-

search Program, and technical and trade magazine editors.

Speakers from several plating supply companies described plating processes which have resulted in improved finishes on zinc die castings (Fig. 1).

Service and accelerated corrosion test results were reviewed. Experiences in plating die castings with the new processes were related.

Results of research on plating zinc die castings at Battelle Memorial Institute, sponsored by American Zinc Institute were reported in detail (Fig. 2). Die casting plating practices were studied to determine best practice.

There was general agreement that a double nickel plate and heavier chromium plate (either single or double) produced greatly improved finishes on zinc die castings, and resisted corrosion for long periods of time.

It was reported that a plate composed of 0.0004 inch copper, 0.0008 inch duplex nickel and 0.00002 inch chromium resisted accelerated corrosion tests better than Type 302 and Type 430 stainless steels. The chromium plating was done under the following conditions:

Chromic acid 45-47 oz./gal.
Sulfate ratio—155:1
Temperature 130 deg. F.
Current density—300-350 a.s.f.

Comments by a panel of automotive industry plating experts (Fig. 3) emphasized the fact that the automotive industry requires plated zinc die cast parts that will remain bright for the life of the car. This goal is now in sight because of improved nickel and chromium plating processes available.

While looking forward to durable, corrosion resistant plated zinc die castings in the light of presently available improved chrome and nickel plated zinc die castings used by the industry, the panel members called for continuing work by the industry on faster and more reliable accelerated corrosion tests; a realistic appraisal by automobile stylists and designers of the intricacy and shape of the parts to be specified; an effort to understand the basic reasons why the newly devised plating systems work better; use by the automobile manufacturers of certain minimum requirements for plating, including thickness and reaction to accelerated tests; and a demand that zinc die casters produce high quality castings that can lend themselves to superior plating results no matter which of the new, improved systems is used.

Such plated zinc die castings which

Fig. 1—R. G. Kenly, vice president, the New Jersey Zinc Company and president of the American Zinc Institute, Inc. welcomed members and guests to the opening technical session of the Symposium on plating of zinc die castings. Shown (left to right) are: Dr. R. B. Saltonstall, technical director, Udylite Corporation, Detroit, Mich.; Dr. M. M. Beckwith, manager, electroplating division, Harshaw Chemical Co., Cleveland, Ohio; J. L. Kimberley, executive vice president, American Zinc Institute, Inc., New York, N. Y.; Mr. Kenly; Clarence H. Sample, supervisor of electroplating, International Nickel Co., Inc., New York, N. Y., H. Mahlstedt, mgr., Plating Products, Metal & Thermit Corp., Rahway, N.J.

meet auto industry specifications in accelerated tests or outdoors on the car will be well received by automobile industry customers, and fear of early service failure will cease to be a deterring factor in choosing zinc die castings for various external die castings, panel members stated.

In summing up for the panel discussion and the general discussion from the floor, Dr. Schrade F. Radtke, director of research for American Zinc Institute's Expanded Research Program said: "We feel that we have reached a milestone here — progress has been made. We have established that improved plating systems have given us a new standard of quality. More improvements are on the way, however, and there is more work to do."

Fig. 2—E. A. Anderson, chief of products application, The New Jersey Zinc Company of Pa., opened the second technical session of the plating symposium. Other speakers (left to right) are: Dr. Charles L. Faust, chief, Electrochemical Engineering Division, Battelle Memorial Institute, Columbus, Ohio; W. H. Safranek, assistant chief, Electrochemical Division, Battelle Memorial Institute; Maurice R. Caldwell, manager electroplating and finishes, Doehler-Jarvis Div. of National Lead Co., Grand Rapids, Michigan; Mr. Anderson.

Fig. 3—Chairman and speakers representing the automotive industry at the closed session of the plating symposium. Shown (left to right) are: R. D. Wysong, manager of manufacturing research, Studebaker-Packard Corp., South Bend, Indiana; W. S. Snyder, chief metallurgist, American Motors Corp., Detroit, Mich.; J. T. O'Reilly, assistant manager, Process Development Department, Manufacturing Staff, Ford Motor Co., Dearborn, Mich.; Dr. S. F. Radtke, director of research, American Zinc Institute, New York, N. Y.; Donald M. Bigge, managing engineer, Chrysler Corporation, Detroit, Mich.; C. F. Nixon, head, electrochemistry research laboratories, General Motors Research Staff, Detroit Mich.; Walter L. Pinner (chairman) manager of electroplating development, McGean Chemical Company, Cleveland, Ohio. (Photographs by PRODUCTS FINISHING.)

TRAINING COURSES

Free Course in Electroplating

The course of study in electroplating given at the Fort Greene Evening High School, 29 Fort Greene Place, Brooklyn, N. Y. (formerly Brooklyn Evening Technical High School) will begin its Spring term on February 2, 1960.

The session is divided into classroom discussion and laboratory experiments. Topics include simple calculation, reading graphs, chemistry of the plating tank, pH, wetting agents, pitting, deionizing. Laboratory experiments include solution analysis, Hull cell studies, anodizing.

Registration begins January 25, 1960, and will be held daily thereafter from 7:00 to 8:30 P.M. Classes will meet on Tuesday and Thursday from 6:45 to 8:15 P.M., including about six Fridays. The term begins February 2 and ends June 28, 1960. Register with *L. Serota* in rooms BW17 or 3E12.

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NECROLOGY

Kurt Potoff

Kurt Potoff, co-owner of U. S. Galvanizing and Plating Equipment Corporation, died on November 6. Mr. Potoff also had been one of the owners of Industrial Plating Corporation, Brooklyn, N. Y.

Dr. W. H. Schuette

Dr. William H. Schuette, a vice president of The Dow Chemical Company and general manager of its Midland Division, died of a heart attack at the Midland Hospital on Sunday, November 8. He had been stricken at his home a short time before.

Dr. Schuette, who was 47, had been Midland Division general manager since 1955. He was elected a director of the company in 1957 and a vice president last year.

MEETINGS of INTEREST to FINISHERS

Dec. 12. Christmas Party, Newark Branch, A.E.S., Hotel Robert Treat, Newark, N. J.

Jan. 15-16. Second Annual Dixie Regional Technical Session, A.E.S., Saxony Hotel, Miami Beach, Florida.

Jan. 23. Annual Educational Session, Grand Rapids Branch, A.E.S., Pantlind Hotel, Grand Rapids, Mich.

Jan. 26-27. Third Annual Meeting, Society of Vacuum Coaters, Hotel Biltmore, New York, N. Y.

Jan. 30. Annual Meeting and Banquet, Chicago Branch, A.E.S., Conrad Hilton Hotel, Chicago, Ill.

Feb. 19-20. Seventh Interim Meeting, A.E.S., and Golden Anniversary Educational Meeting and Banquet, Philadelphia Branch, Ben Franklin Hotel, Philadelphia, Pa.

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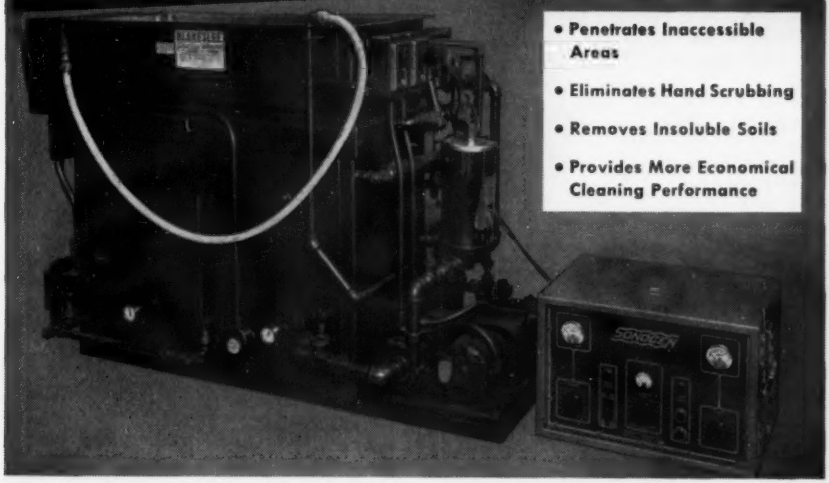

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